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W.H.O. Expert Committee on Malaria, 5th Report No. 80. June, 1954. 38.

The Malarial Sub-Committee of the Colonial Medical Research Committee's Recommendations on the use of antimalarial Drugs. Brit. Med. J. 1954, ii, 148.

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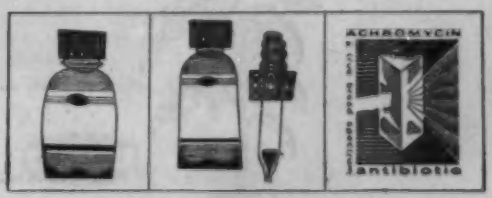

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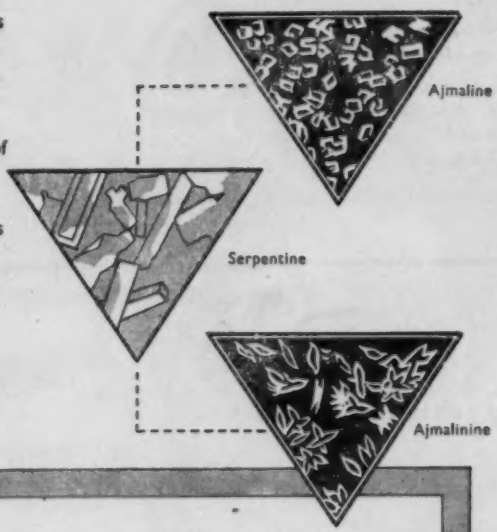

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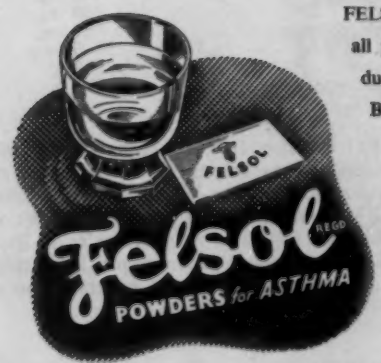

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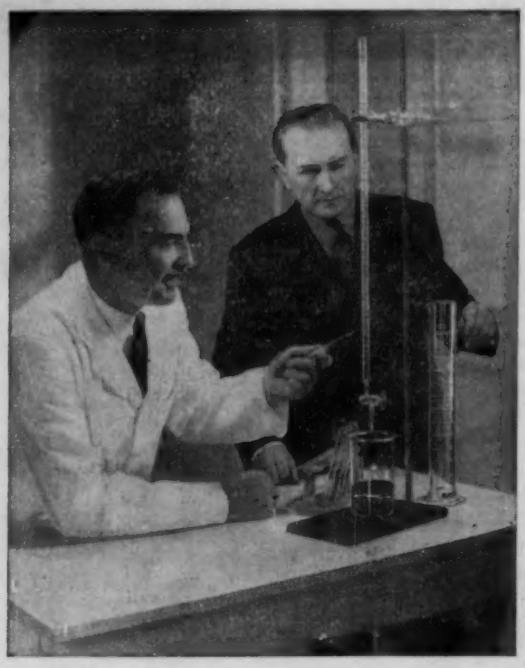

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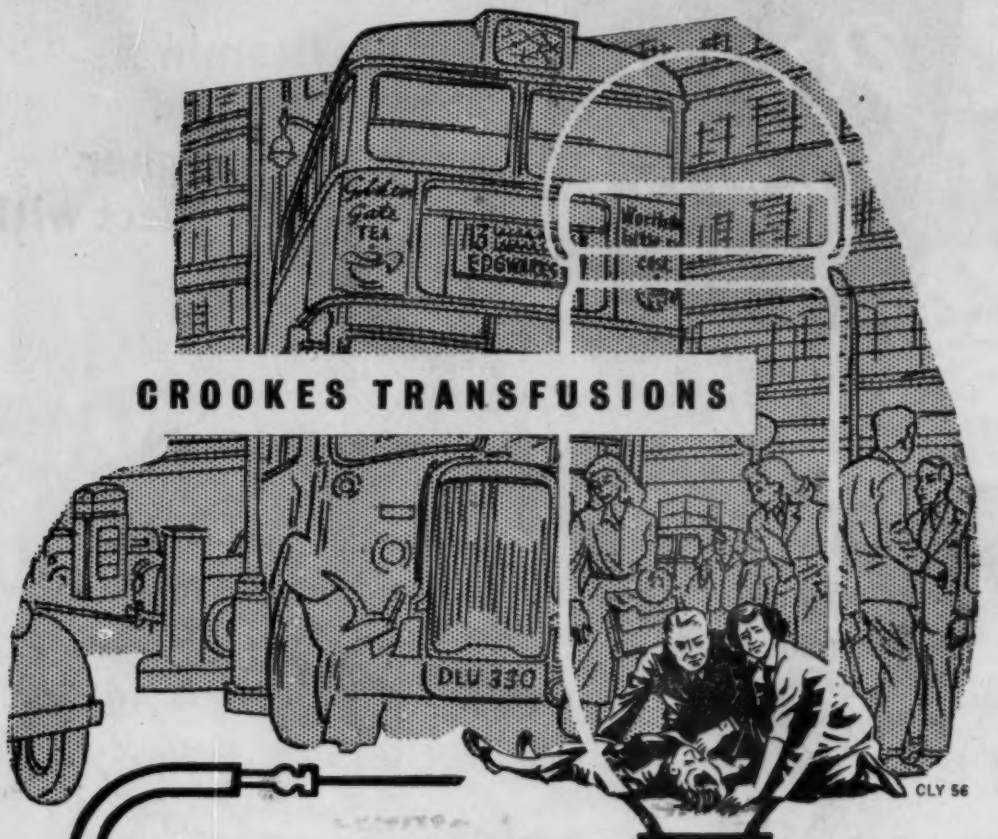

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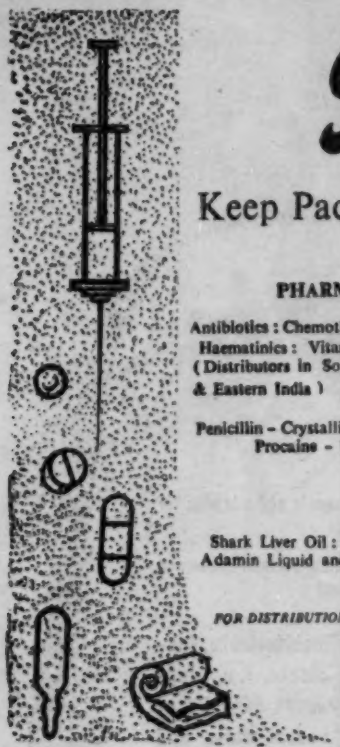

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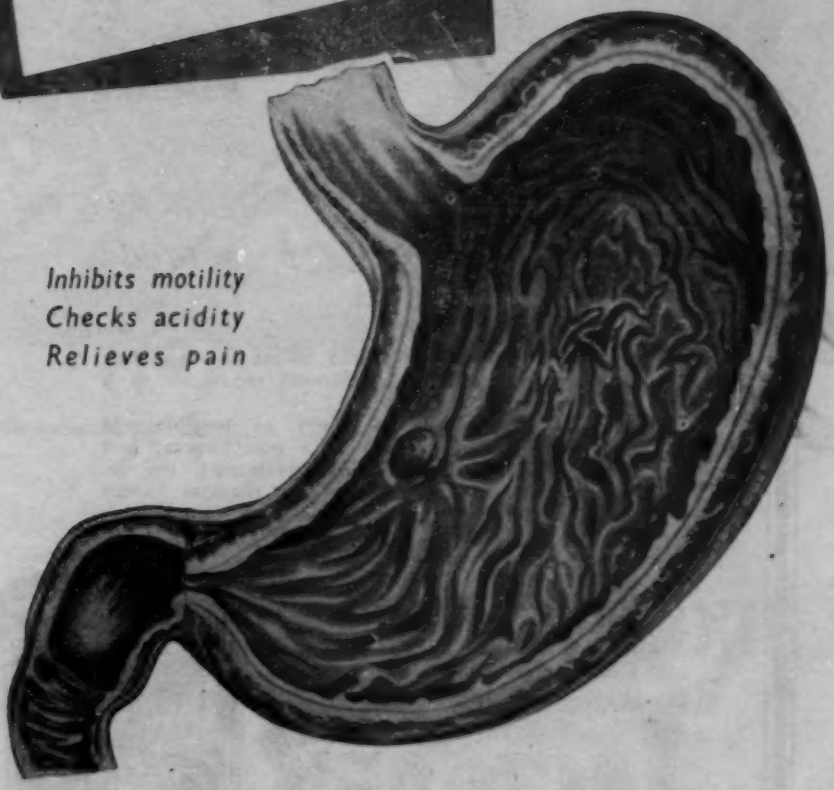

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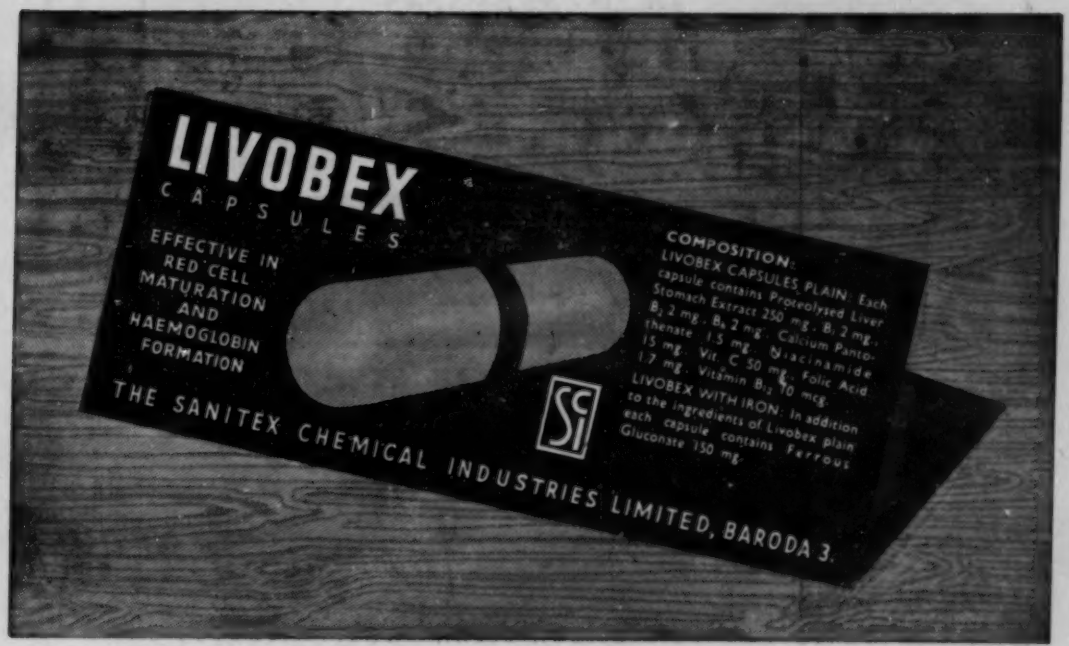
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ORIGINAL ARTICLES

CARCINOMA OF THE THYROID GLAND

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Carcinoma of the thyroid gland is said to be an uncommon condition in India but from our experience it is not as rare as would be suggested by a perusal of the Indian literature on the subject (Cruickshank, 1938; Srivastava, 1942 and 1948; Sachdeva and Khanna, 1951; Mangalik and Wahal, 1952; Gault *et al* 1955).

The results of study of 43 cases of carcinoma of the thyroid admitted in this hospital between January 1949 and July 1954 are as follows:

Age incidence—In America the average age for carcinoma of the thyroid as reported by various authors is about 48 years (Cole *et al* 1945; Fisher and Fisher 1951; Cerise *et al*, 1952). Ward (1944) states that 1/5th of the cases were below 40 years and ⅔rds between 40 and 70, while Crabtree and Hunter (1953) report that 40 per cent of their patients were below 40 years. From Scandinavia, the same age incidence as that reported by Ward is given by Bertelesen *et al* (1950). In Britain, Branson and Houston (1949) found the average age to be 42·7 years, and Graham and McWhirter (1947) found it to be 59·75 years. In Ceylon, Cooray (1944) found the commonest age to be between 45 and 64 years. The mean age at death of Willis's 9 necropsy cases was 70 years (Willis, 1948).

Cole *et al* (1945) point out that the average age of their cases of carcinoma of the thyroid is somewhat lower than the usual 'cancer age' of their country, and that this is due to the fact that malignancy of the thyroid is not uncommon in children. A number of cases of carcinoma of the thyroid have been reported in children (Hare and Newcomb, 1950), and indeed two cases of patients being born with carcinoma of the gland have been recorded (Rosh and Raider, 1945; Symmers, 1941).

In our series, although we have no instance of cancer of the thyroid occurring in a child, four of our cases were aged 15 years, 18 years, 20 years and 20 years; 15 out of our 43 cases (35 per cent) were below 40 years of age. Our oldest patients were two aged 65 years and only five other patients were above 60 years of age. The average age of our series works out to be 44 years at the time of diagnosis. The ages at death of four cases were 40, 42, 43 and 55 years.

Sex ratio—All the series from the Western countries (e.g., Ward, 1944; Fisher and Fisher, 1951; Cerise *et al*, 1952; Graham and McWhirter, 1947) report a much higher incidence of carcinoma of the thyroid in women than in men because of the higher incidence of goitre in the female. The male: female ratio, as given by the above authors, varies from 1:2 to 1:3·5. In our series, of the thyroid cancer, sex incidence was almost equal, there being 21 males to 22 females, whereas in 42 consecutive cases of non-malignant disease of the thyroid, there were 10 males to 32 females. It is difficult to evaluate the significance to these figures which may be biased by the fact that many more men than women attend our hospital as outpatients (ratio 1·2:1).

During the years under review there were 166 thyroidectomies in our hospital of which 35 cases (21 per cent) were reported as malignant after histological examination.

If the non-toxic nodular goitres are considered separately, the incidence as available from the literature is higher and varies from 3·7 to 17·3 per cent (Fisher and Fisher, 1951 ; Cerise *et al*, 1952). We had 132 operated cases of non-toxic nodular goitres out of which 35 were malignant giving an incidence of cancer in such glands to be 27 per cent. We had no example of cancer occurring in a toxic gland nor in one which was uniformly enlarged.

The incidence of carcinoma in the non-toxic solitary nodule is high and varies from 9 to 24·5 per cent (Anglem and Bradford 1948 ; Crile and Dempsy, 1949). We had 69 cases of non-toxic solitary nodules of which 21 proved to be malignant, an incidence, of 30 per cent for cancer in nontoxic solitary nodules of the thyroid. Not one of our 43 cases showed signs of hyperthyroidism.

Autopsy material—Lastly in the consideration of the incidence of thyroid cancer, something may be said about its occurrence in autopsy material. Vanderlaan (1947) found only 5 cases of cancer of the thyroid occurring in 18,668 autopsies in the Boston City Hospital in the half century from 1896 to 1945. This apparent rarity has been explained by some authors as being due to the fact that patients with thyroid cancer are rarely allowed to stay in the hospital for any considerable time and are usually at home for the terminal state of the disease. During the period of five and half years under review there were 1025 autopsies in our hospital out of which only 1 case was of thyroid carcinoma. Two other patients died in the hospital but post-mortem examinations were not made, and another patient died a few days after being discharged from the Hospital.

Pathology

The gross appearance varies considerably and the tumour remains encapsulated for a considerable time (Fig. 1, *vide* Plate). In our series out of 36 cases 27 cases had an encapsulated tumour. The tendency of thyroid cancer to metastasize while the primary tumour is still encapsulated is well known and this is brought out by the fact that the nine of these encapsulated tumours showed evidence of metastastic spread.

The criteria used in the histological diagnosis of thyroid cancer has been discussed by Gault *et al* (1955). The nomenclature employed for the various histological types are numerous and almost every author gives a classification of his own. The simplest classification is therefore adopted in this paper, and the following gives the incidence of the various types in our series.

Adenocarcinoma	11 cases
Papillary adenocarcinoma ..	21 cases
Hürthle cell carcinoma ..	1 case
Anaplastic carcinoma ..	5 cases
Unclassified	4 cases

Very anaplastic carcinomas are sometimes reported as sarcomas. This difficulty was well illustrated in one of our cases. The section of the thyroid very closely resembled a fibrosarcoma (Fig. 2, *vide* Plate). Three months after removal of the growth the patient returned to the hospital with metastases in the regional lymph nodes which on section showed a typical epitheliomatous appearance.

Metastases.—Among our 43 cases we had 13 instances of secondary deposits in lymph glands, 8 in bones and 6 in lungs. The sites of secondary deposits in the 8 patients with bony metastases were as follows: clavicle (3 patients), skull (2 patients) (Fig. 3), sternum, spine, humerus, palate and scapula. Thyroid secondary tumours sometimes pulsate due to vascularity, and we had two examples of this, one in the skull and the other in the clavicle. In

Fig. 3—Thyroid Carcinoma with a Big Secondary Deposit in the Skull which was Pulsatile.

the former case an attempted removal of the tumour from the skull had to be abandoned because of excessive bleeding during operation. One of our cases which came to autopsy had secondary deposits in the lung (Fig. 4, *vide* Plate), heart and kidney. Another case showed clinical evidence of disseminated secondary deposits in the brain.

Cruickshank (1938) reported one case and Outerbridge (1947) reported five cases of thyroid metastases which on histological examination were found to consist in part or completely of apparently benign thyroid tissue. We had one striking example of this in a patient with metastasis to the spine which showed a histological picture indistinguishable from normal thyroid tissue.

Lateral aberrant thyroid is perhaps metastasis in a cervical lymph node from a small unsuspected primary carcinoma of the thyroid. This is the opinion of Willis (1948) who says "there is no evidence developmentally that aberrant thyroid tissue ever occurs in the lateral position". If this view (i.e., lateral aberrant thyroids are secondary deposits) is accepted it becomes necessary to examine the thyroid gland of patients with the so-called lateral aberrant thyroids and to perform a homolateral lobectomy in all cases. One of our cases presented with a lump in the lateral part of the neck without an enlargement of the thyroid which could be detected clinically (Fig. 5). On section this lump was found to contain thyroid tissue with papillary arrangement of the epithelium. This patient refused further operation.

FIG. 5—LATERAL ABERRANT THYROID.

Symptoms and signs—In our series of the 42 patients only 10 gave a history of rapid growth and 10 complained of pain in the gland, whereas 22 patients had pressure symptoms in one form or another. On examination 32 of these growths were felt to be firm wholly or in part. In order to evaluate the importance of the signs and symptoms mentioned above, in the diagnosis of thyroid cancer, the clinical manifestations of 42 consecutive patients with non-malignant disease of the thyroid were also analysed. Furthermore, the malignant cases were subdivided into 'early' and 'late' cases. The latter group consisted of those who exhibited metastases or were deemed inoperable; twenty two patients fell into this category.

TABLE 1—COMPARISON OF SIGNS AND SYMPTOMS IN MALIGNANT AND NON-MALIGNANT CASES

	Average duration of lump	Rapid growth	Pain	Pressure symptoms	Firmness
Non-malignant cases (42)	8 years	12	1	15	21
Malignant cases (42) ...	6 years	10	10	22	32

TABLE 2—ANALYSIS OF THE 42 MALIGNANT CASES

Rapid growth		Pain		Pressure symptom		Firmness	
Early	Late	Early	Late	Early	Late	Early	Late
4	6	2	8	8	14	12	20

From Tables 1 and 2 the following conclusions seem to be warranted: (1) A history of rapid growth is not peculiar to malignant cases, in fact more patients in the non-malignant group gave such a history, than in the malignant group.

(2) Pain in the gland occurred in about ¼th (i.e., 10 cases) of the malignant cases, but is very rare in the non-malignant (1 case only). However, 8 of these 10 cases were inoperable and there is evidence that in nearly all these the pain developed after metastases had taken place. Pain, therefore, is a late symptom of carcinoma of the thyroid and almost synonymous with inoperability.

(3) Pressure symptoms occurred more frequently in the malignant than in the non-malignant group, but it would seem that these symptoms are due more to the size of the growth rather than to its malignancy.

(4) The feeling of firmness, on palpating the growth, was common in both groups, being more frequent in the malignant groups. However, this is not a subjective phenomenon, which draws the attention of the patient.

It is obvious, therefore, that with the present day diagnostic methods an early clinical diagnosis of carcinoma of the thyroid is impossible.

In the radiological diagnosis of thyroid metastasis to bone, it is important to remember that the secondary tumours predominately cause an osteolytic lesion (Fig. 6, and Fig. 7, *vide* Plate),

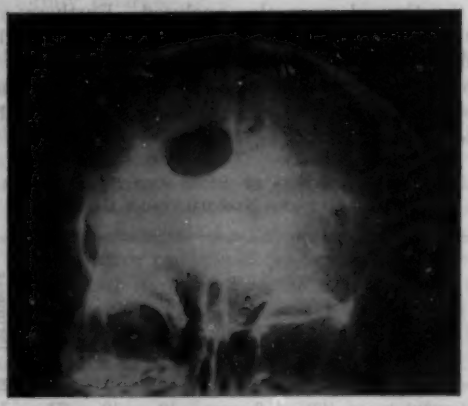

FIG. 6—SECONDARY THYROID DEPOSIT IN THE SKULL SHOWING DESTRUCTION.

thus giving an appearance of rarefication or destruction of bone in the x-ray (Sherman and Ivker 1950). As regards the radiological appearance of lung metastases in our series, the size of the shadows varied considerably in each case, ranging from the typical 'golf ball' appearance to a picture of diffuse carcinosis, simulating miliary tuberculosis (Figs. 8, 9 and 10, *vide* Plate). This appearance can be distinguished from the latter condition, as in diffuse carcinosis, the shadows are more numerous at the bases, the apices being relatively free. Cancer of the thyroid is said to be the commonest source of miliary metastases to the lung (Shanks and Kerley, 1952)

TREATMENT

Surgical—The surgical treatments advocated for carcinoma of the thyroid are varied. It is not proposed to deal with them in detail here. There has been no uniformity in the treatment of the cases reviewed in this paper because the patients during the course of these 5½ years were admitted under the care of 8 different surgeons. A total thyroidectomy was done in 16 of these patients and all except one had the growth involving both lobes. A lobectomy was done in seven cases, all of which clinically had the growth in one lobe only. An excision of the "adenoma" was done in nine cases, in all of which a preoperative diagnosis of malignancy was not made. Of the nine inoperable cases, 4 had a biopsy taken from the primary growth or from one of its metastases and the remaining five had no surgical intervention whatever. A block dissection of the cervical lymph nodes was performed in three cases, while 7 cases had only a local excision of the affected lymph nodes. Resection of a solitary bone metastasis was performed (following thyroidectomy) in four cases. One of these who had the medial end of a clavicle removed returned a year later with secondary deposits in the sternum and dorsal spine causing paraplegia. Another case with a secondary deposit in the clavicle who underwent the same treatment was seen again almost two years later with no evidence of recurrence.

Roentgen therapy—Only ten of our patients had a course of deep x-ray therapy post-operatively at this hospital, partly because this form of therapy was not available for a time during the period under review. Many of the patients were advised to go elsewhere for deep x-ray.

PROPHYLAXIS

Many authors are of the opinion that nodular goitres of any size and in patients of any age should be treated surgically, because of the danger of malignant change in these glands. Colcock (1951) writes, "It seems reasonable to assume that if patients can be induced to consult their physicians about a lump in the neck as they have been taught (in America) to do for a lump in the breast, and if their physicians will advise the immediate removal of all discrete adenomas of the thyroid, the number of people who die each year from cancer of the thyroid will be appreciably reduced." This statement will be better appreciated when we note that the average duration of the thyroid mass in our series was found to be as long as six years. Almost the same figure is quoted in two other articles by Cole *et al* (1949) and Cerise *et al* (1952); the latter found the average interval between the initial examination for the condition and admission for treatment of the cancer to be as much as 2·8 years. Because of the high incidence of carcinoma in such glands, some authors (Cole *et al*, 1949; Crile 1950; Cerise *et al*, 1952) feel that a simple enucleation of the non-toxic solitary nodule of the thyroid is insufficient, and advocate a subtotal thyroidectomy

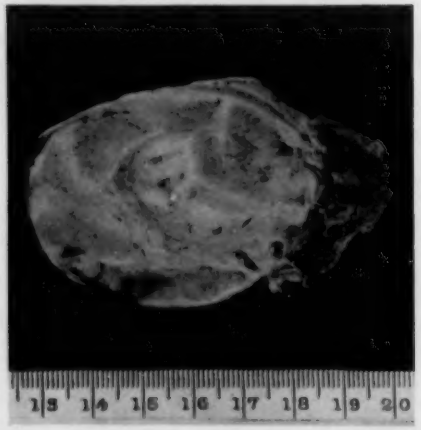

Fig. 1—Showing encapsulation.

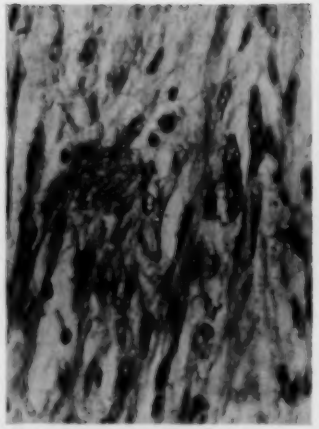

Fig. 2—Anaplastic carcinoma simulating fibrosarcoma.

Fig. 4—Thyroid metastases to the lung (autopsy specimen).

Fig. 7—Secondary thyroid deposit in the humerus showing bone destruction.

Fig. 8

Fig. 9

Fig. 10

Chest skiagrams of three patients with thyroid metastasis to the lungs showing pictures ranging from a golf ball appearance to miliary mottling.

Fig. 1

Fig. 6

Fig. 1—Showing *on the right,* anterior and lateral views of left ulna with multiple cystic spaces and *on the left,* twin foci of rarefaction in the humerus.

Fig. 6—Showing no alteration in the ulnar lesion but attempt at sclerosis in the humerus.

Fig. 2—Showing thinning of the cortex and cystic spaces in the upper end of the right femur.

Fig. 7—Showing complete disappearance of the cysts and sclerosis.

Fig. 2

Fig. 7

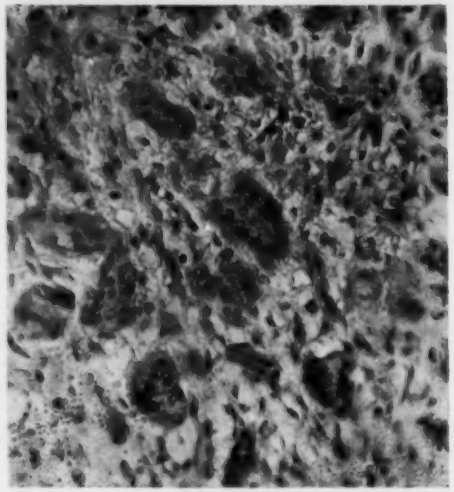

Fig. 3

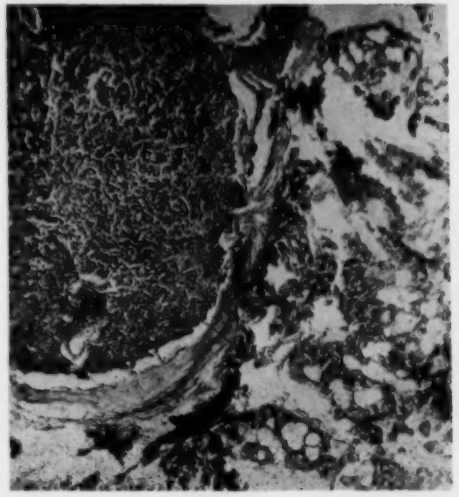

Fig. 4

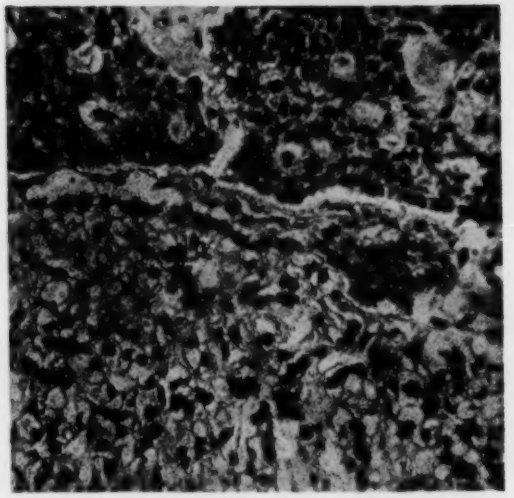

Fig. 5

Fig. 3—Illustrating osteoclastic activity, and giant cells. (H & E × 400). Fig. 4—Illustrating wasserhelle-cell adenoma, with a capsule separating the neoplasm from the normal parathyroid tissue composed of cords of chief cells, each column or more of which is in turn separated by punched out areas representing fat cells. (H & E × 100). Fig. 5 - Showing rows of chief cells bordering the columns of waterclear cells. The large cell with vacuolated cytoplasm and characteristically basally placed nuclei of wasserhelle cells of the tumour are well illustrated. (H & E × 100).

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of the affected lobe. This operation would seem to be preferable because, carcinoma may develop around an adenoma rather than in it, as pointed out by Dargent and Guinet (1952).

Prognosis

The operative mortality in the treatment of carcinoma of the thyroid as reported in the literature varies from 1·8 to 10·2 per cent (Pemberton and Lovelace, 1941; Cerise *et al*, 1952); out of 35 patients who underwent a thyroidectomy for cancer, in our series, two patients died in the immediate post-operative period, a mortality of 5·7 per cent. One of them, who had metastases in lymph glands underwent a total thyroidectomy with a block dissection of the glands, had also concomitant tuberculosis of the lung and diabetes. The other patient was an advanced case of a highly anaplastic growth who also had the same surgical treatment as the first patient and at autopsy was found to have widespread metastases (lung, heart and kidney).

Crabtree and Hunter (1953) find that the presence of cervical lymph node metastases seem to have no constant prognostic value, the death rate in the cases with metastases being no higher than for those cases without any lymph node metastasis.

Crile and Hazard (1953) have correlated the age of the patient with the prognosis. They say that the prognosis of patients below 40 years is very good because the thyroid carcinomas, in these patients, are or behave like papillary carcinomas. On the other hand, the prognosis of patients over sixty years of age is poor because most of these are of the more malignant non-papillary variety.

In our series as mentioned above at least four of the patients are known to have died, and four of the treated patients returned to the hospital with recurrences. One of our patients is alive and working as a compounder in the hospital 11 years after thyroidectomy, although he had a secondary deposit (in a lymph node) removed 5 years ago and another 2 years ago. Two other patients who reported themselves for a check up 2 years after discharge from hospital had no recurrence.

In trying to correlate the age of the patient with the prognosis, it was found that of the carcinomas of the 15 patients who were below 40 years of age, 9 were papillary and 6 of the non-papillary type (4 adenocarcinomas, 1 Hürthle cell tumour and 1 anaplastic), 3 of these having distant secondary deposits. All the 7 patients aged above 60 years had the non-papillary type of adenocarcinoma, most of them with distant metastases. From this it would appear that prognosis seems to be very bad for those above sixty years although a young age does not necessarily preclude the patient from having the more malignant varieties of thyroid cancer and distant metastasis.

It is not possible to give a five year survival rate for our cases now. The rate can be expected to be low as most of our patients presented themselves late as evidenced by the fact that a pre-operative diagnosis was possible in 52 per cent of our cases.

Summary

An analysis of 43 consecutive cases of carcinoma of the thyroid admitted to the C.M.C. Hospital, Vellore from 1st January 1949 to 15th July 1954 is reported. The emphasis has been on the clinical aspects of the disease. The pathology has been briefly discussed. In 38 of these 43 cases there was histological proof and the remaining 5 cases had unmistakable clinical evidence of thyroid carcinoma.

The incidence of carcinoma in all goitres, in non-toxic nodular, and solitary nodular goitres, removed surgically, was found to be 21 per cent, 27 per cent and 30 per cent respectively.

Acknowledgments

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ADENOMA OF THE PARATHYROID GLAND ASSOCIATED WITH OSTEITIS FIBROSA CYSTICA

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Parathyroid glands were first recognised by Sandstrom in 1880. Welsh (1897) recorded from a histological study of forty parathyroid glands that these glands are composed of chief cells, wasserhelle or water-clear cells and oxyphil cells. Erdheim (1903) drew the attention of the physiologists to the presence of fat inside the cells and also the existence of lipoid containing cells in the stroma of the glands. Kurokawa (1926) based on a study of 815 glands gathered from necropsy material emphasised that they are composed of chief cells containing glycogen but no fat upto puberty and following puberty upto the age of 40, fat cells increase in number. He also pointed out that non-functioning adenoma and cysts of varying size may be encountered beyond puberty.

DeSanti (1900) observed neoplasm of parathyroid origin. Upto 1920 reports of parathyroid growths were based on the incidental finding of them at routine necropsy examinations. Mandl (1933) removed an enlarged parathyroid associated with von Recklinghausen's generalised osteitis fibrosa. Albright *et al* (1934) stimulated interest in the systemic studies of the calcium and phosphorus metabolism in all cases of renal lithiasis which unearthed a significant number of cases of hyperparathyroidism.

Adenoma is the commonest enlargement of the parathyroid and this is confirmed by Castleman and Mallory (1935, 1937) who found 138 cases of adenoma in a review of 160 cases of hyperparathyroidism. Enlargement of single gland is by far the most frequent. The variability in the size of the enlarged parathyroids from 0·05 grammes to 100 or more grammes accounts for the increasing difficulties in clinical recognition of the same and the clinician's lot is more hazardous in case the enlarged single or more parathyroids are placed in ectopic sites. In a considerable number of parathyroid enlargements, the tumourous mass is not visible in the neck. Often indirect evidence of hyperplasia is sought by the surgeon by way of roentgenological evidence of osteitis fibrosa cystica alone or associated with renal stones. The incidence of bone and renal lesions observed by Castleman and Mallory (*loc. cit.*) in their cases and also the reports reviewed by them are shown in Table 1. The same authors report cases with acute renal failure consequent to secondary hyperparathyroidism.

TABLE 1—SHOWING COMPARATIVE INCIDENCE OF BONY AND RENAL LESIONS IN HYPERTHYROIDISM

Lesions	Castleman and Mallory		Other authors	
	No.	%	No.	%
Osteitis fibrosa alone	5	20	70	58·8
Renal stone alone ...	11	44	3	2·52
Osteitis & renal stone	9	36	46	38·6

Parathyroid hyperplasia secondary to primary renal disease and rickets has gained increasing

attention by the surgeon in recent years. Castleman and Mallory (*loc. cit.*) and Castleman (1952) have contributed much to the understanding of this aspect of the subject and their review over a background of their personally studied cases offers clues to many previously unexplained clinical problems. In both primary and secondary hyperparathyroid states the surgeon is assured by the constant finding of elevated serum calcium and low phosphorus and *vice versa* respectively. The bizarre and at times uncertain clinical manifestations have forced the surgeon, pathologist and the biochemist to undertake joint investigations for the recognition of hyperparathyroidism in unexplained cases of osteolytic lesions or renal lithiasis. Since a case of parathyroid adenoma recently studied by us exemplifies the need for such team work and the excellent healing of the bony lesions following the operative removal of the adenoma and the histopathological study of the tumour is worthy of being recorded.

Case Report

Mrs. N. M. aged 45, was admitted on 28-6-1955 in the Government General Hospital, Guntur, for a painful and tender swelling over the left elbow of three months' duration. She denied history of injury to the part at any time. The margins of the swelling were ill defined and it appeared to be the result of expansion of the upper end of the left ulna. The skin over the swelling though stretched, was not adherent to the deeper structures.

X-ray findings on admission: The upper end of the left ulna showed rarefaction and cystic spaces (Fig. 1, *vide* Plate).

Similar changes were seen in the right femur (Fig. 2, *vide* Plate). A repeat x-ray examination on 8-8-1955 showed progression of lesion in the ulna.

By 1-9-1955 her general condition deteriorated and repeat x-ray on 3-9-1955 revealed: Left humerus: Spots of rarefaction in the mid shaft (Fig. 1, *vide* Plate). Left ulna: Progression of cystic lesion observed. Right femur: Exaggeration of the originally seen rarefaction. Skull, vertebral column, pelvic bones, left femur, tibia, fibula and the kidneys appeared normal.

At this stage investigations for exclusion of a parathyroid tumour were suggested.

Laboratory investigation (9-3-55)—Blood: Serum calcium—12·1 mg. per cent. Inorganic phosphate—3·28 mg. per cent. Alkaline phosphatase—26·8 Bodansky units. Proteins—8·21 g. per cent. Urea—15 mg. per cent. Urine calcium—210 mg. per cent per day.

Biopsy report from the expanded and cystic upper end of the left ulna on 19-3-55; Marked osteoclastic activity and the presence of multiple osteoclastic giant cells (Fig. 3, *vide* Plate) need to exclude the possibility of osteitis fibrosa cystica, since multiple bones are involved.

The laboratory data encouraged us to venture on exploration for spotting the offending parathyroids.

Operation notes—Under general anaesthesia through a collar incision in the neck the right lobe of the thyroid was mobilised by ligaturing the superior and middle thyroid vessels. Two small nodules seen over the posterior aspect of the right lobe of the thyroid were incised. They were outside the capsule of the thyroid. Similar procedure was adopted on the left side but no mass bearing any resemblance to parathyroids was found. The wound was closed in layers.

A week after the operation the patient appeared to be nervous and complained of tingling and numbness. No evidence of hypoparathyroid state was observed. Calcium was administered intravenously for a few days and the patient manifested improvement in general health and also ceased to mention of any pains over the bones.

Biopsy report of the removed nodules: The mass submitted was irregularly oval shaped and of orange-brown colour. It was soft but firm and sectioned surface was yellow in colour. It weighed 500 mg. The sections from the entire tumour mass were histologically studied. In the periphery of the sections were seen normal parathyroid tissue composed of cords of chief cells separated by fat cells (Fig. 4, *vide* Plate). Adjoining the same was seen capsulated and well demarcated adenoma mainly made up of 'wasserhelle' cells. The transition from the chief cells to those of wasserhelle cells appeared to be gradual and the major portion of the neoplasm was composed of the water-clear cells. These cells typically showed abundant clear or vacuolated cytoplasm and basally placed nucleus (Fig. 5, *vide* Plate). No mitotic figures or hyperchromatic nuclei were seen. Fat cells were not seen or were negligible within the tumour mass and cystic spaces were significantly absent.

Morbid histological diagnosis: 'Wasserhelle-cell' adenoma of the parathyroid gland.

The patient showed remarkable improvement, and the repeat blood chemistry on 13-10-55 showed: Serum calcium—8·2 mg. per cent. Inorganic phosphate—4·54 mg. per cent. Alkaline phosphatase—15·2 Bodansky units. Urine calcium—32 mg. per cent per day.

X-ray of the abdomen disclosed no shadows close to the kidneys and thus excluded the presence of renal lithiasis. X-ray of the left ulna and humerus and right femur showed disappearance of the cystic spaces and healing by sclerosis (Figs. 6 & 7, *vide* Plate). Non-extension of the lesions into other bones was noticed.

The patient was discharged on 17-1-55. She intimated on 9-3-56 that her general condition was much better although she was being troubled by pain in the lower limb.

Comments

The osteolytic and cystic lesions of the multiple long bones roentgenologically visualised in this case offered the clue to doubt the histological features resembling giant-cell tumour observed in the biopsy bit and gave the stimulus to investi-

gate for probable hyperparathyroidism. Elevation of serum calcium and alkaline phosphatase and increased excretion of calcium in urine offered supportive evidence sufficient to encourage the surgeon to explore for parathyroid hyperplasia. The small single adenoma excised in our case accounts for the slight rise in serum calcium and this bears testimony to Castleman's (*loc. cit.*) observation that the weight of the parathyroid bears direct relationship to the elevation of serum calcium, and a figure of 19 mg. per cent was recorded by him in some of the largest parathyroid adenomata.

The absence of renal lithiasis found on repeated roentgenological examinations and the yellowish brown soft but firm neoplasm comprising of "wasserhelle cells" leave little doubt that the case is one of primary hyperplasia. Castleman probably rightly asserts that the gross features of primary hyperplasia are pathognomonic and characteristic.

The rapid and progressive improvement observed both in the general condition and the bony lesions as disclosed by the follow up x-ray pictures of the patient and the return to normal of the biochemical findings following excision of the parathyroid adenoma assure the surgeon and the patient, absence of any more offensive parathyroid tissue.

Our finding of wasserhelle-cells in close proximity to columns or cords of chief cells and the transitional forms only supports the view of the monophyletic origin of these cells from the parent chief cell. The physiological stimulus often determines the exclusive nature of wasserhelle-cell hyperplasia. Histological examination of parathyroids recovered from routine necropsies in the pathology department disclosed mixture of chief, oxyphil and wasserhelle cells scattered all over in no known pattern and transition forms were also met with, all substantiating the monophyletic origin of these functionally three morphologically different cells.

Summary

1. Literature pertaining to parathyroid hyperplasia is briefly reviewed.

2. Clinicopathological findings in a case of 'wasserhelle-cell' adenoma of the parathyroid gland are recorded.

3. Diagnostic evaluation of clinical history and diagnostic aids for the same are discussed.

4. The monophyletic origin of the water-clear cell and oxyphil cells from the chief cells of the parathyroid is emphasised in view of the findings in the case recorded above and from the routine autopsy material.

Acknowledgments

We are grateful to Dr. D. Anjaneyulu for the invaluable help rendered. We thank the photo-artists Sri Venkateswarulu and Narasimhulu for the photographs.

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EXPERIMENTAL EVALUATION OF AN INDIGENOUS PRODUCT FOR DISSOLUTION OF URINARY CALCULI

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Extracts of *Didymocarpus pedicellata* and of *Saxifraga lingulata* have long been used in the indigenous systems of medicine. *Didymocarpus pedicellata* (*patthar phori*) leaves have been used as a cure for stone in the kidney and bladder. Siddiqui (1937, 1939 and 1947) carried out detailed investigations on its chemical constituents. He reported a number of well-defined crystalline colouring matter namely, pedicin, pedicillin, pedicinine, and methyl pedicinine. In addition to these he isolated the essential oil didymocarpine and two polyterpenes named didymocarpol and didymocapinole.

The root of *Saxifraga lingulata* has been reputed to be diuretic, demulcent and to dissolve gravel and stone in the bladder. Hooper (1883), quoted by Wehmer (1935), studied its chemical composition and found it to contain gallic acid and tannic acid 14·2 per cent, glucose 5·2 per cent, besides mucilage and wax.

The present study deals with the experimental evaluation of a drug, claimed to contain extracts

of *Didymocarpus pedicellata* and *Saxifraga lingulata*, in the prevention and dissolution of calculi in the bladder. The experiments were performed on young male albino rats taken from the stock of Central Drug Research Institute, Lucknow. The rats were approximately of the same age and their weight varied from 150 to 200 g. They were kept throughout on a diet consisting of wheat flour chapaties, milk (half an ounce per day), green vegetables and tap water. Stone formation was induced in these rats by placing a foreign body into their bladder after performing suprapubic cystostomy under aether anaesthesia, adopting full aseptic precautions. A rectangular piece of zinc sheet, two by three millimeters in size, was used for the purpose. The foreign body acted as a nucleus for deposition of urinary salts in the form of a stone. It was weighed on a Mettler microbalance and was sterilised before being put into the bladder.

The animals were sacrificed three weeks after the operation, the bladder was opened again and the stone formed around the foreign body was taken out. These stones were then dried in a vacuum desiccator over concentrated sulphuric acid for 48 hours and were weighed. The actual amount of stone formed was determined by subtracting the weight of the foreign body from the weight of the stone with the foreign body inside it. In some of the bladders secondary stones were found in addition to the primary one around the foreign body, these were discarded. Some of the rats died earlier than three weeks, their stones were also not taken into account.

The freshly voided urine of these rats was frequently tested by means of universal indicator paper and the pH was found to range between 6 and 7. No significant difference was found in the medicated series from those of the control group of rats. Bacteriological studies of the urine were not made. However, to eliminate the effects of infection, a group of rats were put on a broad spectrum antibiotic and thus the effects of the drug were studied under bacteriologically standard conditions.

The results have been assessed by comparing the amount of stone formed in the medicated rats with those of the control group. For comparison, the stone formed has been expressed as the average amount formed per rat. Since the weight of the foreign bodies varied slightly, the stone formed has also been expressed as the amount formed per miligram of the foreign body.

Experiment 1—In this experiment, a batch of forty rats was taken. Twenty of them were put on the new drug in tablet form and 20 were kept as control. Those which were given the drug were divided into two groups of 10 each. Group I, was given 1/10th of a tablet each per day, while Group II was given 1/5th of a tablet each per day. For Group I rats, one tablet was dissolved in 10 c.c. of tap water and 1 c.c. of this mixture was delivered into the stomach *via* a canula passed through the oesophagus. This was done for three weeks. The foreign body was sterilised by immersing in rectified spirit for fifteen minutes and then washing with sterile water. Of the control group 17 rats survived the three week period of observation, while of the experimental group receiving the drug, 15 rats survived the same period.

The weight of the stones formed varied widely from rat to rat. In the control group (20 cases), the largest stone formed in one of the rats was 161·8 mg. while the minimum formed in one of them was 19·8 mg. The average amount of stone formed per rat came to 52·45 mg. The combined weight of the foreign bodies put in the 17 surviving rats was 303·65 mg. and the amount of stone formed on them was 887·75 mg., the average per milligram of the foreign body coming to 2·5 mg.

In the experimental group I receiving the drug (10 cases), the largest stone formed weighed 158·2 mg. and the smallest was 21·4 mg. in weight, average per rat being 63·27 mg. and the average per milligram of the foreign body was 2·7 mg. In the experimental group II receiving the drug (10 cases), the largest stone weighed 256·8 and the smallest was 31·9 mg., the average being 104·24 mg. per rat. The average amount of stone formed per milligram of the foreign body was 5·8 mg. The stone in the group receiving the drug acquired the smell and the colour of it, most probably because of the excretion in the urine of the colouring matter and the essential oil.

Experiment 2—In this experiment fifty rats were taken, twenty were kept as control and thirty were given the drug. The control rats were given a broad spectrum antibiotic only, while the others were given a broad spectrum antibiotic along with the drug. One capsule of the antibiotic (250 mg.) was dissolved in 50 c.c. of water. One c.c. of this solution was given to each of the control rats. In the remaining 30 c.c. of antibiotic solution, three tablets of the drug were mixed and one c.c. each of this mixture was given to the experimental group of rats, i.e., those receiving the drug. The method of administration was the same as in the previous experiment. This was given daily for three weeks. The foreign bodies in this experiment were sterilised by immersing them in boiling water for fifteen minutes.

Among the control group of rats (20 cases), 15 survived the three week period. The largest stone in one of them was 85·15 mg. and the smallest was 0·1 mg. and in one of the rats no stone material got deposited on the foreign body. The average stone formed per rat was 31·88 mg. and the average stone per mg. of the foreign body was 1·57 mg. In the group receiving the drug 23 rats, out of 30, survived the period of experiment, the heaviest stone was 170 mg. and the smallest was 29·6 mg., the average per rat was 83·13 mg., and the average stone formed per milligram of the foreign body was 4·5 mg.

Discussion

The method of inducing stones adopted in these experiments was chosen because it is rapid and less cumbersome and does not produce metabolic changes in the body of the rats as other methods do, and thus the number of variable factors are reduced to a minimum. The zinc piece remains as an inert foreign body. The method is now being widely employed the world over for the study of various factors which lead to the formation or dissolution of the urinary calculi. The stone forming salts get deposited on the foreign body and after a layer has been deposited it is as good as a natural stone in the bladder. If a drug can prevent the growth of this stone then only it can be expected to dissolve a stone in the natural state.

The dose of the drug used has been 1/10th of a tablet in most of the rats. The usual dose prescribed for adult human patients is three to six tablets a day. The dose given to these rats thus comes to 1/30th of the minimum human dose.

The findings in these experiments indicate that the drug used has in no way prevented stone formation around the foreign body nor has it even reduced the amount deposited. The stone formed in the control group without antibiotic was 54·45 mg. per rat, which is slightly less than the amount formed in the group of rats receiving the drug (63·27 mg. per rat). When we consider the group of rats which were given the double dose of the drug, the difference is quite marked. An average of 104·24 mg. stone formed per rat in this group which is about twice the amount formed in the control group of rats. These figures give the impression that the drug has actually accentuated the stone formation. The higher doses were thus of no benefit.

The administration of antibiotic made a significant reduction in the amount of stone formed in the control group, although it failed to do so in the group of rats receiving the drug. In the control group the amount of stone formed per rat was only 31·88 mg. per rat when the antibiotic was given as compared to 52·4 mg. when the antibiotic was not given. This difference is not seen in the group receiving the drug in which the respective figures are 83·13 mg. with antibiotic and 63·27 mg. without it.

The above data were analysed statistically and it revealed significant difference in the mean quantity of the stone formed in the two cases, namely the case of control rats and of those to whom the drug was given. It appears that the effect of the drug is to promote stone formation rather than dissolve it.

Summary

Experiments were carried out on 90 rats to evaluate the stone dissolving properties of the indigenous product. The method employed for producing the stones in rats was by putting a piece of zinc in the urinary bladder after suprapubic cystostomy. The average weight of stone formed in the control group of rats was 52·45 mg. per rat while it was 63·27 mg. per rat when the drug was given. In another experiment a broad spectrum antibiotic was given to the rats to keep the bladder free from infection. Under these conditions, 31·88 mg. of stone formed per rat in the control group and 83·13 mg. in those to whom the drug was given. To note the effect of increased dosage of the drug, a group of rats was given double dose. This resulted in the amount of stone formed to about double.

Thus it may be concluded that under the conditions of these experiments the drug had no effect in the prevention or dissolution of the urinary calculi, rather it augmented their formation.

Acknowledgments

I am grateful to the Lucknow University for a research grant for studies on formation and dissolution of calculi. My thanks are due to the Himalaya Drug Co., Bombay, for supply of cystone tablets, containing the indigenous drug extracts, for trial.

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SPECIAL ARTICLE

MEDICAL PROBLEMS IN RADIATION PROTECTION†

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In spite of the fact that x-rays have been known for over half a century, and although they have been widely used in medicine, their biologic effect is still poorly understood. We know that we can kill cells with them ; we know that different cells react differently to radiation, a knowledge on which the treatment of malignant tumours for instance depends. Radiation used to arrest the growth of a cancer must not stop the growth of normal tissue. There is agreement to the fact, that protection against radiation must be instituted but there is not yet any agreement on the question to which dose of x and γ radiation a human being can be exposed for repeated and long periods of time without suffering damage. More and more establishments, medical, biological as also industrial, are beginning to use radioactive materials for a variety of purposes. With this increase in the use of radiation sources in industry and medicine, larger and larger groups of people are working with and consequently exposed to radiation. Radiation cannot be felt, seen or heard. Our senses give us no warning to their exposure. When over-exposure becomes evident through physical signs and visible changes, the damage has been done and it is usually too late, at least with our present medical knowledge to remedy it. We are then faced with the problem of devising a system, which will guard the people working with radiation sources from undue exposure, which protects them from the immediate effects and damage by radiation, as well as from the delayed effects. The immediate effect of radiation is fairly well known but the latent is not yet understood. A number of people engaged in radiation work 25 or 30 years ago, who were well in the interim are now getting diseases which in retrospect must be blamed on radiation doses received a quarter of a century ago. These radiation doses to which they were exposed years ago were then considered safe, but as more and more medical evidence comes to light have to be reviewed. This is the reason why the permissible maximum dose to which a person is allowed to be exposed in any one week has been progressively reduced in the last 10 years. In 1950, the international commission revised its recommendation (International recommendation on radiological protection, 1951). The revision was based on a study of radiation effects on :

Superficial injuries ; general effects on the body, particularly the blood and blood forming organs effecting the production of anaemia and leukemias ; the induction of malignant tumours ; other deleterious effects including cataract, impaired fertility and reduction of life span ; and genetic effects.

The International Commission in 1950 recommended as permissible weekly exposure level 300 milli roentgen. It is likely that this level will again be reviewed from time to time as more empirical and experimental evidence of the biological effect of radiation becomes known.

As it is necessary to prevent a person from getting more than a certain amount of radiation in a unit time, he must be able to measure the actual dose that he receives during a working week. Measuring the radiation will not only record the weekly exposure of every person but also make it possible to know the total radiation he receives during the years he is exposed to it, an information which might become very necessary to have in the future. We also can discover, for instance, a fault in the machinery the person is working with, let us say, a leak in a radon plant or an inadequate shielding of an x-ray machine which is not discovered by other means. In order to determine how many milli roentgen a person is exposed to, we make use of the fact that x-rays blacken a photographic emulsion. The persons working with radiation are wearing on their laboratory coats a small x-ray film inserted into a cassette or film holder (Fig. 1, *vide* Plate). If the operations bring the hands in close contact with a radiation source, let us say a doctor inserts radium needles or radon capsules into a cervix for treatment of carcinoma, he wears a film badge tied to his wrist or a ring on his finger into which a small photographic film has been inserted (Fig. 2, *vide* Plate). These films are regularly collected and developed once a week. Their blackening is compared with films blackened by known amounts of radiation and their density measured by a densitometer. In this way the amount of radiation received by the person who wore this film for one week can be calculated. Such a film badge service has been organised by the Health Physics Section of the Department of Atomic Energy and will be extended in the near future so that those hospitals, laboratories and industries who are working with

† Paper presented at the third annual convention of the Society for the Study of Industrial Medicine, Bombay, 1955.

radiation sources can benefit by this personnel monitering system.

A radiation health protection set up, which includes a film badge service should also be concerned with the periodic checking of blood counts of all persons who come regularly in contact with radiation. The haemopoietic system in man is sensitive to radiation. Damage to the blood-forming organs is mirrored in cell changes of the circulating blood. The examination of blood counts and blood films is undertaken to detect early changes in the blood cells which might be due to radiation so that further radiation exposure can be prevented. Three blood counts are taken at monthly intervals on the individual before he starts any work with radiation in order to establish his variation of the normal count. This might not always be practicable. But once on radiation work the blood counts are regularly taken every three months. An individual record card is kept for each person. The blood values are carefully recorded and the absolute number of the different blood cells plotted on graph paper. By recording the monthly exposure to radiation on the same graph, a correlation of changes in the different blood cells and actual radiation dosage received is possible. There is still no agreement on the question what influence small repeated radiation exposures will have on the blood count of a person, but we can draw on the experience from those centres in other countries which have over the years kept records on the amount of exposure to radiation of individuals and their blood counts. Sievert (1950) in Sweden states that radiation quantities as low as 100 milli roentgen per week can give rise to blood count changes in a comparatively short time. Knowlton in U.S.A. noted a small but significant fall in the number of leucocytes in people exposed to 200 milli roentgen per week over 2 years. Turner (1954) in England found that people exposed to 300 milli roentgen a week (the now internationally accepted maximum permissible dose) show changes in their peripheral blood count after about a year, which apparently persist. A swinging white blood count with slowly declining peaks is observed, which has not been seen in people receiving up to 100 milli roentgen per week. The significance of these changes is not yet known. All we can say at this point is, that these changes do occur. And it will take years of gathering information on blood count changes before we will learn their long term significance.

The third aspect of a medical protection service concerns changes in the finger tips of those people whose hands come in close contact with a radiation source. Here again our knowledge is sketchy and systematic investigations are just beginning. It is known from the experience of early radium workers, that a number of them developed severe damage to their hands, burns, chronic ulcerations and radiation cancers. We also know that radiation causes changes in the epidermal ridges of the finger tips (Braasch and Nickson, 1948). What we do not know yet is how much radiation is needed to damage the epidermal ridges and whether the early changes are in any way connected with later more serious damage. It is therefore suggested to take finger tip impressions on persons who are handling radioactive materials. The impressions are made in Zelex, an alginate impression material used by dentists. A paste is made by adding water to the substance, and the finger tip is firmly pressed into the paste and held there for a few minutes until the compound has hardened. A clear replica of the epithelial ridges is thus produced. The finger tip of a person who has never received any radiation shows a regular pattern. The well defined ridges are uniform in height and of almost equal width (Fig. 3A, *vide* Plate). In the mould of a person who has worked with radon for 7 years, the pattern of the ridges and valleys are lost and the epidermal folds are apparently atrophied (Fig. 3B, *vide* Plate). Finger moulds are taken on radiation workers at regular intervals to observe the development of the changes in the epithelial pattern in order to understand their aetiology and ultimate prevention.

I have tried to outline a few points in the vast field of radiation protection and would like to end with the plea that all institutions using ionizing radiation begin to measure regularly the amount of radiation received by the persons working with it and to start recording their blood counts, and where possible to observe finger changes by moulding of finger tips. It will be possible by such a concerted effort to learn more about the vital problem of how small chronic radiation exposure affects man. Only when we have increased our knowledge in this field will it be possible to prevent medical tragedies and protect people adequately and intelligently from radiation hazards.

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Fig. 1—Film badge to measure the amount of radiation received by the wearer.

Fig. 2 - Film badge ring worn by persons whose hands come in close contact with a radiation source.

Figs. 3A and 3B - A—Finger mould of a person whose hands have not been exposed to radiation. B—Epithelial pattern damaged by radiation.

PETERS—*Medical Problems in Radiation Protection (p. 53)*

Fig. 1—Showing swelling of the right testis.

Fig. 2—Macroscopic appearance of tumour mass cut into two.

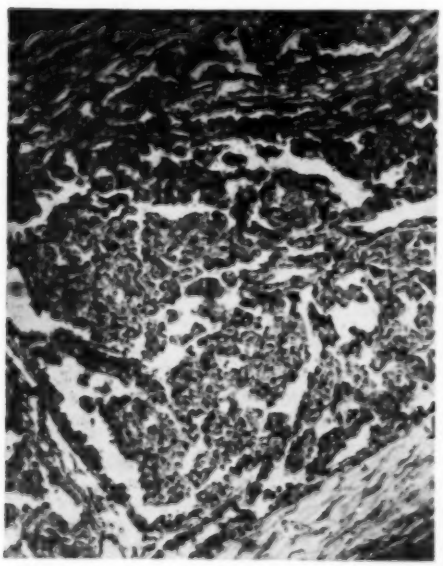


Fig. 3—Showing areas of uniform anaplastic cells.

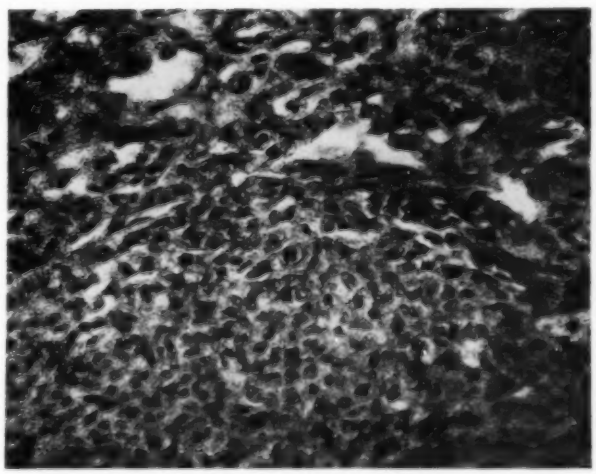
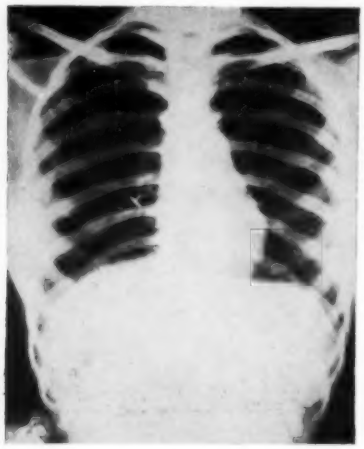


Fig. 4—Showing moderate number of mitotic figures. ×270

SHARMA AND SAMUEL—*Embryonal Carcinoma of the Testis in an Infant (p. 57)*



Figs. 1A and 1B—Postero-anterior and lateral skiagrams showing the thumb tack lying in the posterior basal segmental bronchus on the right side.

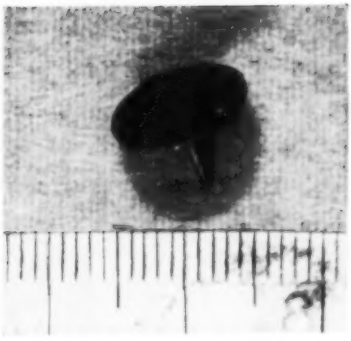


Fig. 2—A photograph of the thumb tack after removal.

THOMPSON WELLS ET AL—*Bronchotomy for Endobronchial Foreign Body (p. 58)*

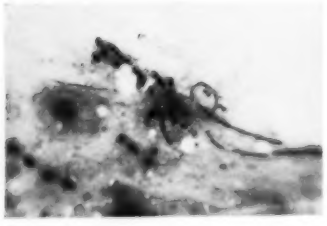


Fig. 2—Yeastlike bodies with mycelia. ×570

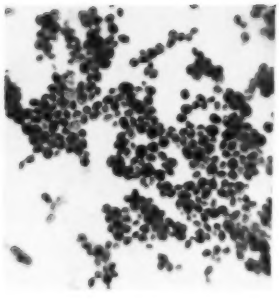


Fig. 3—Bodies of different shapes in clusters. ×570

Fig. 1—Showing enlargement of both ventricles and pulmonary conus slightly full.

BANERJI AND GUPTA—*Role of Candida Albicans in an Acute Respiratory Infection (p. 58)*

KONAR ET AL—*Aortic Septal Defect (p. 61)*

ENGRAVED & PRINTED BY REPRODUCTION SYNDICATE, CALCUTTA 6

CASE NOTES

EMBRYONAL CARCINOMA OF THE TESTIS IN AN INFANT

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Testicular tumours are comparatively rare and constitute only 5·8 per thousand of all malignant tumours in males. The condition is still more infrequent in infants and children. Julien (1925), quoted by Rusche (1952), collected 137 cases occurring before puberty. In Dean's series (1940), of 500 testicular tumours, eight occurred in children between 1 and 14 years. The tumours are similar to those found in adults, not only as to the structure but also in their clinical course and response to treatment.

Of the 12 cases reported by Rusche (1952), eight were teratomas, three embryonal carcinomas and one dermoid cyst. Testicular tumours were present at birth in four cases, two were teratomas, one dermoid and one embryonal carcinoma (Julien, 1925, quoted by Rusche, 1952). Of the twelve cases reported by Gross (1953) one was a teratoma, one seminoma, one interstitial cell tumour and the rest embryonal carcinoma.

There are no pathognomonic symptoms. Painless enlargement of testis is the usual presenting symptom. This may be mistaken by a casual observer for a hydrocele or hernia and valuable time lost. Sometimes the patient may be brought with pain and even metastases.

Removal of the primary tumour is advisable to detect the nature, method of treatment and prognosis. Embryonal carcinomas have a high degree of malignancy and unfavourable prognosis. Rusche (*loc. cit*), however, reported a case where a simple orchidectomy resulted in a child being alive and well at the end of 3 years. Because of the rarity of malignant testicular tumours in infants the following case was thought worth reporting.

CASE REPORT

B. L., aged 16 months, was admitted to the S. M. S. Hospital on 2-3-1955 with a swelling of the right testis (Fig. 1, *vide* Plate) which had been noticed by the mother a year ago. The swelling was painless and had attained the present size gradually. There was no history of trauma. Loss of weight and progressive weakness were present for six months.

On examination the child was anaemic and emaciated. The pulse rate was 125 per minute, the temperature 90°F. and respiration 23 per minute.

The right testis was found to be about $5'' \times 4\frac{1}{2}'' \times 4''$ having irregular nodules at its upper end. It was heavy, hard in consistency and did not transilluminate. There were prominent veins over the swelling. Left testis and cord were normal. Metastases were present in the right para-aortic glands.

The liver was just palpable. No other abnormality was detected.

An orchidectomy was performed under general anaesthesia on 11th March 1955. Fig. 2 (*vide* Plate) illustrates the removed specimen cut into two. Deep x-radiation was given to the abdominal glands with some reduction in their size.

Histological report—The essential component of this tumour is an embryonal carcinoma which is showing areas of completely undifferentiated form, made up of large pleomorphic or uniform anaplastic cells (Fig. 3, *vide* Plate) with homogenous, aminophilic cytoplasm and without cell borders at many places. Nuclei are irregularly oval or round with light chromatin pattern. Moderate number of mitotic figures are present (Fig. 4, *vide* Plate).

There is, however, no regular stromal pattern as seen in seminoma, where there is somatic differentiation. There is an attempt at organisation of some of the cells into ill developed epithelial form, which has recently been called testicular adenocarcinoma. No trophoblastic differentiation could be found. Extensive necrosis is present as would be expected in any rapidly growing tumour.

SUMMARY

A case of embryonal carcinoma in an infant is reported. The swelling was noticed at the age of 4 months but the child was brought for the treatment a year later.

ACKNOWLEDGMENT

We wish to express our thanks to Dr. L. R. Sarin, Superintendent, S. M. S. Hospital for permission to publish the hospital records.

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BRONCHOTOMY FOR ENDOBRONCHIAL FOREIGN BODY

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Thomas *et al* (1955) reported their experience with four cases of bronchotomy for endobronchial foreign bodies. We wish to report an additional case.

Case Report

J. D., a 17 year old female, was admitted on 30-7-55. She stated that ten months prior to admission, while cleaning her teeth with a thumb tack, she laughed and inhaled the object. She ignored the incident but after six months consulted a doctor because of attacks of asthma. An x-ray of the chest revealed the foreign body to be lying in the right main bronchus. Two attempts were made to remove the foreign body through a bronchoscope but without success.

Physical examination on admission was essentially negative. A study of additional x-rays of the chest taken on admission suggested that the thumb tack was lying in the posterior basal bronchus on the right side (Figs. 1A and 1B, *vide* Plate). This was confirmed during a bronchoscopy but no attempt was made to remove the foreign body because it was wedged into the small bronchus and the point could not be grasped.

On 16-8-55 a right thoracotomy was performed and the posterior basal segmental bronchus exposed by dissecting laterally along the branches of the inferior pulmonary vein. The point of the thumb tack was found to have perforated the bronchial wall. The posterior wall of the bronchus was incised longitudinally for 1 cm. and the foreign body easily removed (Fig. 2, *vide* Plate). After sucking out the lumen the incision in the bronchial wall was closed with a few interrupted cotton sutures.

The postoperative period was complicated by atelectasis of the superior segment of the lower lobe on the right but this responded to a bronchoscopy and repeated tracheal suction. She was discharged on 2-9-55.

Discussion

We would like to re-emphasize that a bronchotomy is not the treatment of choice for endobronchial foreign bodies but that there are some situations in which it becomes a safer procedure to adopt.

One consideration which should always be kept in mind is that if the foreign body has a sharp point this must be grasped or adequately protected before any attempt is made to remove the object through the bronchoscope; if in this case the base of the thumb tack had been grasped and the tack removed, the point which had already perforated the bronchial wall may well have rent it and opened up an avenue for infection to spread into the surrounding lung parenchyma.

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ROLE OF *CANDIDA ALBICANS* IN AN ACUTE RESPIRATORY INFECTION

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The fungus *Candida or Monilia albicans* can occur as a commensal in the normal mouth and throat of some persons and is, therefore, sometimes encountered in routine sputum examination. It has been observed that the fungus increases in relative quantity when there is a disturbance of the normal bacterial flora as may occur in the sputum in bronchial infections (Dyke, 1951). When the fungus is excreted in large numbers in the sputum during an acute respiratory infection in a carrier, the question, however, arises whether it has an aetiological role in the infection, since *C. albicans per se* is capable of infecting the respiratory tract (Castellani, 1928).

We report here a case of an unusually severe respiratory infection in a patient who appeared to harbour *C. albicans*. An attempt was made to study the role of *C. albicans* in the pathogenesis of the disease by cutaneous sensitivity tests to Monilia antigen. A further clue was afforded by *in vitro* studies of the susceptibility of the fungus to antibiotics.

Case Report

A male gardener, aged 45 years, was admitted on 8-10-54 with a history of fever without remission and cough and headache of 4 days' duration. The past history was essentially negative. The patient denied previous chest complaints.

On examination the patient was a thin built adult, looking very ill. Temperature was 101·6°F, pulse 100 per minute and respiration 24 per minute. The tongue was very dry and coated. The liver and the spleen were not palpable. A few crepitations were heard at the bases of the

lungs and rales and occasional rhonchi in the right scapular region. Expectoration was scanty, tenacious and brought up with difficulty. The sputum was thick, had a coarse granular character and had a peculiar yeast-like odour. Dark coloured blood was frequently expectorated mixed with the sputum. X-ray of the chest showed markedly increased bronchial striations in both lungs. Microscopic examination of smears of freshly passed sputum† repeatedly showed no acid-fast bacilli. Gram-positive cocci arranged singly or in chains and Gram-negative bacilli were present in large numbers. In addition a large number of oval or elongated yeast-like bodies with hyphae were seen on every occasion. To determine the source of the fungus mouth washings and freshly expectorated sputum were collected separately and examined. Expectorated sputum alone showed the fungus but not the mouth washings. The case was diagnosed as one of acute respiratory bacterial infection while regarding the fungus bodies in the sputum as mere concomitants. The patient was put on sulpha drug 4 g. and penicillin 400,000 units daily for nine days (Fig. 1) but he showed no signs of improvement. Bearing in mind the possibility of the case being one of bronchopulmonary moniliasis owing to the yeast-like odour of the sputum and persistence of large numbers of fungal bodies microscopically, a further bacteriological study of the expectorated fungus was carried out and the fungus was shown to be a strain of *Candida albicans*. Apparently the diagnosis of bronchopulmonary moniliasis appeared to be confirmed and the patient was given pot. iodide gr. 45 orally daily but without benefit. In view of the reported efficacy of aureomycin in this condition (Bardas and Aykal, 1952) it was decided to give it a trial. Aureomycin 250 mg. 6-hourly was commenced on 22-10-54. Within 24 hours the patient showed remarkable improvement; the temperature came down and the tongue became moist. Adventitious sounds disappeared from the lungs in the next few days. An attempt to reduce the dose of aureomycin produced another bout of fever which was duly controlled again by reinstituting full dosage. A total of 11 g. of aureomycin was administered. The subsequent history of the illness was uneventful apart from some difficulty in micturition for a few days probably attributable to debility since no abnormality could be detected on examination of the urinary and nervous systems. Anaemia was corrected with liver extract and iron preparation. A follow-up x'ray showed complete clearing of the chest, but the patient still continued to expectorate granular sputum showing *C. albicans* microscopically. In

† The sputum was collected in a sterile petri dish after the patient had gargled thoroughly with sterile water.

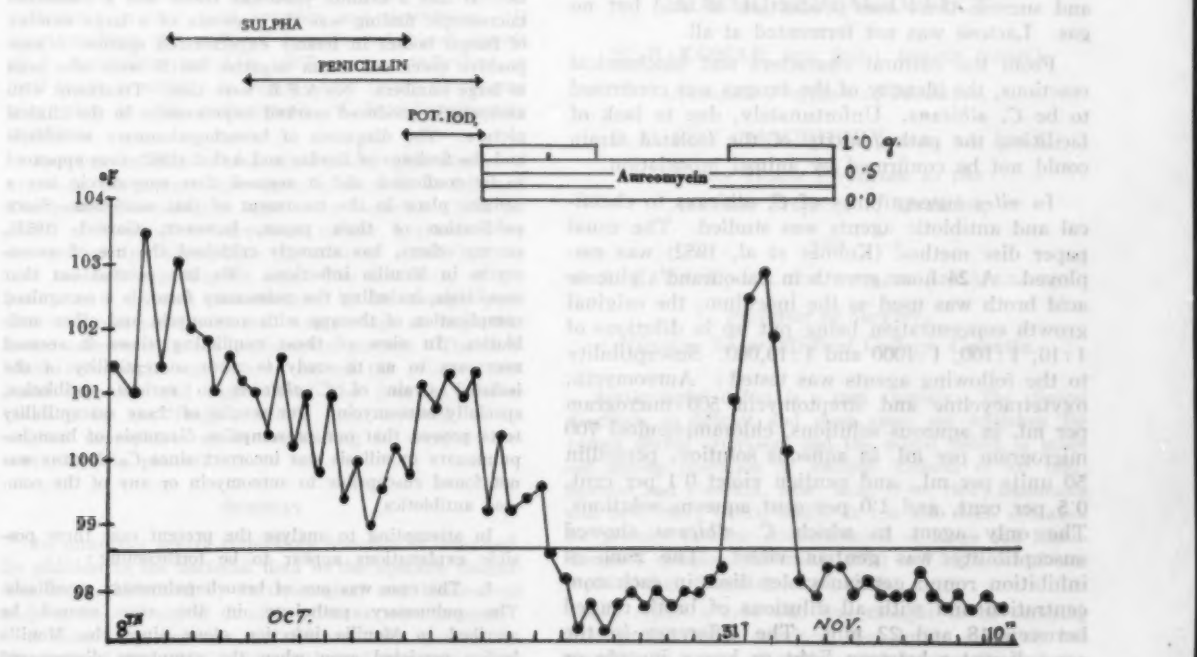

FIG. 1—TEMPERATURE CHART OF THE REPORTED CASE.

view of the inhibitory action of gentian violet on *C. albicans in vitro* an attempt was made to clear the sputum of Monilia by administering aerosol inhalations of 1 per cent aqueous gentian violet solution through a nebuliser. This was only partially successful, however, in that it improved the appearance of the sputum which was now less granular, but the patient though quite symptom-free continued to pass Monilia in the sputum till he left the hospital in December.

Laboratory investigations: R.B.C.—2,550,000 per c.mm.; Hb—6·55 g. per cent, colour index—0·9; W.B.C.—12,500 per c.mm. with neutrophils 76 per cent, lymphocytes 22 per cent, monocytes 2 per cent; E.S.R.—55 mm. in 1 hour (Westergren). Urine and stools—No abnormality. Widal test—Negative in all dilutions. Fixed smears of sputum showed Gram-positive oval or elongated yeast-like bodies with mycelia (Fig. 2, *vide* Plate). On Sabouraud's glucose acid broth growth typical of *C. albicans* was obtained. After 48 hours' incubation at 37°C there was the characteristic absence of surface growth while the fungus grew abundantly at the bottom of the test tube.

In fixed smears made from agar plates and stained by Gram's method oval or rounded or polygonal looking bodies arranged in clusters were seen (Fig. 3, *vide* Plate). Glucose was fermented with production of acid and gas while in maltose and sucrose there was production of acid but no gas. Lactose was not fermented at all.

From the cultural characters and biochemical reactions, the identity of the fungus was confirmed to be *C. albicans*. Unfortunately, due to lack of facilities, the pathogenicity of the isolated strain could not be confirmed by animal inoculation.

In vitro susceptibility of *C. albicans* to chemical and antibiotic agents was studied. The usual paper disc method (Kolmer *et al*, 1952) was employed. A 24 hour growth in Sabouraud's glucose acid broth was used as the inoculum, the original growth concentration being put up in dilutions of 1 : 10, 1 : 100, 1 : 1000 and 1 : 10,000. Susceptibility to the following agents was tested: Aureomycin, oxytetracycline and streptomycin 500 microgram per ml. in aqueous solutions, chloramphenicol 700 microgram per ml. in aqueous solution, penicillin 50 units per ml., and gentian violet 0·1 per cent, 0·5 per cent, and 1·0 per cent aqueous solutions. The only agent to which *C. albicans* showed susceptibility was gentian violet. The zone of inhibition round gentian violet discs in each concentration and with all dilutions of broth ranged between 18 and 22 mm. The difference in the zone diameter between light or heavy inocula or with varying concentration of gentian violet was thus not significantly large. *C. albicans* was not susceptible to the antibiotics used in the test.

Cutaneous sensitivity of the patient to Monilia antigen was studied by the method suggested by Dhariwal and Chakravarty (1954). Antigen was prepared by adding a loopful of 24 hour growth in Sabouraud's broth to 3 c.c. of sterile physiological saline. 0·1 c.c. of the antigen was injected into the dermis of one arm with a control intradermal injection of sterile physiological saline in the other arm. Readings were taken at regular intervals and the final reading made after 48 hours. An area of induration above 5 mm. in diameter was considered significant. In the present case erythema and induration measured 12 mm. in its maximum diameter. In a control study of 30 normal adults with the same antigen an erythematous reaction more than 5 mm. was noted in three cases only and in none of these exceeded 8 mm. in diameter. Induration was always absent in the control series.

Discussion

The case reported here presented clinical and radiological features suggestive of an acute form of bronchitis. From the first, it was apparent, however that the illness was unusual on account of the severity of the toxaemia with paucity of physical signs and early appearance of haemoptysis. The sputum was characteristic. It had a definite yeast-like odour and a consistent microscopic finding was the presence of a large number of fungal bodies in freshly expectorated sputum. Gram positive cocci and Gram negative bacilli were also seen in large numbers. No A.F.B. were seen. Treatment with aureomycin produced marked improvement in the clinical picture. The diagnosis of bronchopulmonary moniliasis and the findings of Bardas and Aykal (1952) thus appeared to be confirmed and it seemed that aureomycin has a definite place in the treatment of that condition. Since publication of their paper, however, Garrod (1953), among others, has strongly criticised the use of aureomycin in Monilia infections. He has pointed out that moniliasis, including the pulmonary form, is a recognised complication of therapy with aureomycin and other antibiotics. In view of these conflicting views it seemed necessary to us to study *in vitro* susceptibility of the isolated strain of *C. albicans* to various antibiotics, specially aureomycin. Our results of these susceptibility tests proved that our presumptive diagnosis of bronchopulmonary moniliasis was incorrect since *C. albicans* was not found susceptible to aureomycin or any of the common antibiotics.

In attempting to analyse the present case three possible explanations appear to be forthcoming:

1. The case was one of bronchopulmonary moniliasis. The pulmonary pathology in the case cannot be ascribed to Monilia infection alone since the Monilia bodies persisted even when the symptoms disappeared and the lungs cleared up with aureomycin and the strain

of *C. albicans* isolated from the sputum was found *in vitro* to be insensitive to aureomycin.

2. The case was one of acute bronchitis of bacterial origin which responded to aureomycin but not to penicilin and sulpha drugs, and the fungus, *C. albicans*, was present in the sputum merely as a concomitant. The observation that pre-existing *C. albicans* have been noted to increase in relative quantity when there is a disturbance of the normal bacterial flora in the sputum in bronchial infections (Dyke, 1951) may be put forward to complete the explanation of the present case. But a careful consideration of the clinical features of the case, viz., marked toxaemia, paucity of physical signs, haemoptysis, and characteristic expectoration of scanty, tenacious and granular sputum having a strong yeasty odour, precludes the possibility of the case being regarded as one of a pure bacterial infection, although there is nothing to completely negative the theory of a fulminant and acute type of bacterial infection.

3. The case was one of acute bronchitis of bacterial origin which responded to aureomycin but not to penicillin and sulpha drugs, in which the pathological process was rendered more severe as a result of the presence of the fungus *C. albicans* in the respiratory tract. This view seems the most plausible to us. In this connection the observations of Ikeda (1936) appear significant. He states—"In the early stages of the disease the organism (i.e., *C. albicans*) apparently maintains a more or less saprophytic existence in an area of low grade inflammation perhaps contributing by its presence towards persistence or recurrence. Under favourable conditions in an existing lesion the organism becomes facultatively pathogenic causing local invasion and destruction. It may penetrate the walls of bronchi and blood vessels etc." Kurotchkin and Lim (1933) suggest individual or local tissue sensitivity to Monilia as a factor which may play part in the pathogenesis of bronchopulmonary moniliasis.

Keeping in mind these observations the course of events in the present case seems to us to be as follows: The primary aetiological agent was bacterial. This induced a bronchial inflammation further aggravated by the pre-existing saprophytic *C. albicans* which had by now assumed a pathogenic role. The sensitivity of the patient to *C. albicans* (demonstrated by the strongly positive cutaneous sensitivity test) was perhaps an important factor concerned in the pathological process. The antibiotic aureomycin was able to cut off the primary bacterial infection and thus closed the door to further invasion by the fungus, which then reverted to its original saprophytic existence, ending in complete recovery of the patient.

Summary

An unusually severe respiratory infection is described. In addition to the bacterial flora in the sputum, fungus-like bodies identified by bacteriological and biochemical tests to be a strain of *Candida albicans* were present.

A remarkable response was obtained with aureomycin. The isolated strain of *C. albicans* showed no susceptibility *in vitro* to aureomycin or any of the common antibiotics.

The patient showed marked cutaneous sensitivity to the autogenous Monilia strain.

The role of bacterial and fungal infections in this case is discussed.

Acknowledgments

Our thanks are due to Dr. S. Ram for the photographs and to Lt. Col. M. N. Khanna, Chief Medical Officer, for permission to publish the records.

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AORTIC SEPTAL DEFECT

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Aortic septal defect is a rare anomaly. The clinical diagnosis is difficult and most cases are mistaken for patent ductus arteriosus and the actual defect is made out during operation or autopsy (Gibson *et al*, 1950; Spencer and Dworkin, 1950; King *et al*, 1951; Dammann and Sell, 1951; Gross, 1952). It has also been mistaken for primary vascular arteriosclerosis of lungs and Eisenmenger's complex (Littmann, 1953) and high ventricular septal defect (Downing *et al*, 1953).

We report a case who was thought to be suffering from patent ductus arteriosus, but during operation was found to be a case of aortic septal defect. He had also some peculiar features.

Case Report

A. K. G., a male patient aged 18 years, was admitted on 20-4-1954 for dyspnoea on exertion and palpitation since his childhood. These symptoms had been more marked for the last 4 months and he became bed-ridden. He also used to get attacks of precordial distress in the form of heaviness and strangulation. These attacks would come in the evening, but not every day and would last for about half an hour. The episodes were accompanied by dryness of the throat and sweating and the patient would remain in a drowsy state for some time. He did not complain of cough, haemoptysis or cyanosis. There was no past history of rheumatic fever. Family history was not significant.

Examination revealed a thin built slightly anaemic patient. He had no cyanosis, clubbing, oedema or engorged neck veins. Carotid pulsations were vigorous. Pulse was 96 per minute and respiration 30 per minute. Blood pressure on the right arm was 120/20 mm. Hg., and on the left arm 140/20 mm. Hg. In both thighs the systolic pressure was above 260 mm. Hg. and Korotkow's sounds were heard even at 0 pressure. Pulse was regular and of waterhammer type. Precordium was bulged. Apical impulse was in the sixth left intercostal space on the anterior axillary line and was heaving in character. A thrill was felt in the second and third left intercostal spaces close to the sternum. It was present during both systole and diastole. A systolic thill was also felt in the third and fourth right intercostal spaces close to the sternum. Right ventricular type of thrust was felt over the precordium. The second left intercostal space was dull on percussion for some distance from the sternum. Mitral first sound was almost masked by a systolic murmur. In the left second and third intercostal spaces close to the sternum the heart sounds were not heard. There was a very loud rough murmur occupying both systole and diastole. This type of murmur though of lesser intensity was also heard over the third and fourth right intercostal spaces close to the sternum. Heart sound was heard over the peripheral arteries and over chest, back, abdomen, thighs, legs, arms and forearms. The lungs were clear.

Ophthalmoscopic examination showed pulsating retinal arteries. Other examinations were normal.

Investigations: Blood W.R. negative. Urine—no abnormalities. Blood protein, urea, N.P.N., cholesterol—within normal limits. X-ray of the heart—Enlargement of both the ventricles. Pulmonary conus slightly full (Fig. 1, *vide* Plate). No hilar dance detected on screen examination. E.C.G.—Gross left ventricular hypertrophy (Fig. 2). Cardiac catheterization and angiocardiography—inconclusive results; venous pressure—6 cm. of blood, circulation time (A.T.) (Decholin)—16 sec.

He was thought to be suffering from patent ductus arteriosus, and was operated upon on 27-6-54. Findings were: (1) no patent ductus arteriosus; (2) marked dilatation of the pulmonary artery; (3) a prominent thrill over the pulmonary artery, the intensity of which diminished as the palpating finger was moved from the trunk of the pulmonary artery towards the periphery of the left branch; (4) no thrill palpated over the region of the ductus; (5) voluminous jet of blood felt entering the pulmonary trunk. No attempt was made to repair the anomaly.

In August 1954 the patient suffered from occasional attacks of severe palpitation and dyspnoea. He thought that these attacks were similar to those he had previously but were of much greater severity. An attack would come suddenly and he could feel it coming for a minute or two before its onset. It usually lasted for 10 to 15 minutes. It appeared at any time of the day or night but more often during the early part of the night. There were no definite precipitating factors. One of the typical attacks which occurred at 7-55 P.M. on 27-8-54 was as follows:

The patient complained of dyspnoea, palpitation, intense precordial distress in the form of pressure and strangling, sweating and feeling of warmth all over the body. Pulse was 136 per minute and respiration 70 per minute. Blood pressure on the right arm was 200/20 mm. Hg., on the left arm 240/20 mm. Hg. and on both thighs—systolic above 260 mm. Hg. Heart sounds very loud and accentuated. Thrills and murmurs more pronounced. No moist sounds in the lungs. The patient perspired profusely. Pupils slightly dilated.

8-10 P.M.: The patient was suddenly relieved of all the symptoms. Pulse 100/minute, respiration 50/minute; B.P.—right arm 160/30 mm. Hg., left arm 170/20 mm. Hg.

8-25 P.M.: Pulse 90/minute, respiration 30/minute (his usual rate). B.P.—right arm 160/20 mm. Hg.

8-40 P.M.: Pulse 86/minute, respiration 30/minute, B.P.—right arm 120/20, left arm 140/30 mm. Hg.

Straight x-ray of the abdomen did not show any lump in relation to the kidneys.

He left the hospital on 28-10-54.

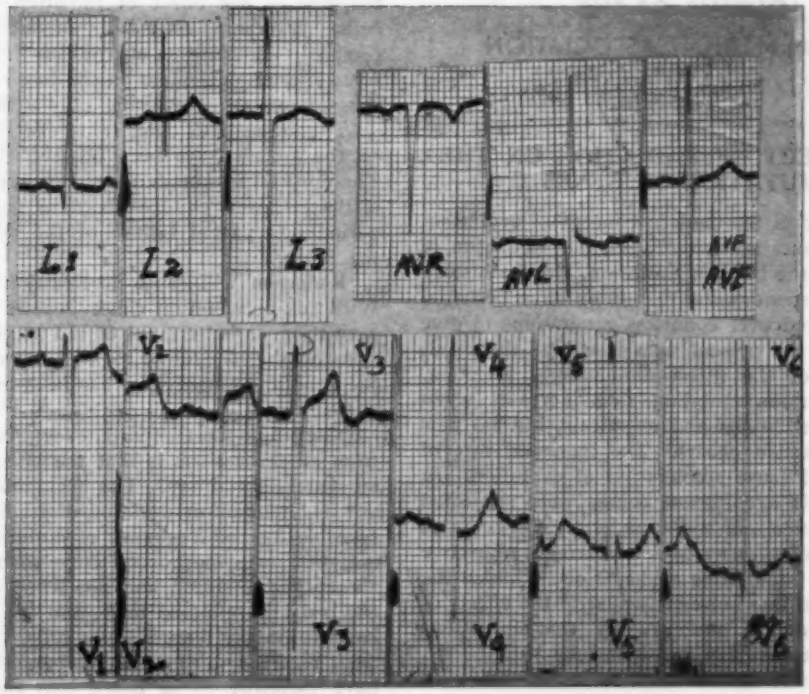

FIG. 2—ELECTROCARDIOGRAM SHOWING GROSS LEFT VENTRICULAR HYPERTROPHY.

DISCUSSION

Surgical closure of aortic septal defect is more difficult than that of patent ductus arteriosus and operative mortality is much higher. When aortic septal defect is of long duration, the cardio-respiratory reserve is markedly diminished and the patients do not stand the operation well (Downing, 1950; Adams *et al*, 1952; Downing *et al*, 1953) and even a successful closure may not benefit the patient (Downing *et al*, 1953). Hence an early diagnosis of the condition is desirable. Downing *et al* (1953) suggested that clinical, electrocardiographic and radiological data were not often sufficient for a diagnosis of aortic septal defect. According to them increased oxygen saturation of right ventricular outflow blood in a patient with atypical patent ductus murmur might be suggestive of the anomaly but similar findings might be obtained in patent ductus arteriosus and high ventricular septal defect.

In our case a rough loud murmur occupying both systole and diastole was present in the left second and third intercostal spaces close to the sternum. A similar murmur though of lesser intensity was also heard over the third and fourth right intercostal spaces close to the sternum. Cardiac catheterisation and angiocardiography unfortunately were inconclusive.

SUMMARY

A case of congenital aortic septal defect is described. The patient was taken to be a case of patent ductus arteriosus and the anomaly was detected during operation. There must have been great arteriovenous shunt to produce characteristic changes in blood pressure in arms and thighs and to make the heart sound audible all over the body.

He used to get episodes of dyspnoea, palpitation, precordial distress, sweating and rise of blood pressure.

ACKNOWLEDGMENT

We are grateful to Dr. A. K. Dutt Gupta, Superintendent, Nilratan Sircar Medical College Hospital for permission to use hospital records.

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THE EFFECT OF RADIATION ON THE MUTATION OF GENES

According to the modern concept of evolution, all normal genes are mutant and the succession of mutations is the basis of evolution. In the history of mankind spontaneous mutations have occurred and re-occurred over countless generations to give rise to what the present man is today—the result of survival of the fittest and natural selection. This spontaneous mutation rate increases when exposed to radiations and chemicals, but no new types of mutation occurs. The increased rate of mutation will cause acceleration of evolution. In the pre-atomic age human beings were subjected to natural sources of radiation, e.g., cosmic rays, ground radiation, naturally occurring radioactive elements and radioactive elements occurring in the body, and got themselves adjusted to the effects of these radiation in such a way that mutations occurred in a desirable and beneficial way.

The study of the effects of ionised radiation on genes began as early as 1926[1]. Experiments carried out on *Drosophilia melanogaster* showed that the mutation by ionised radiation is as universal biological phenomenon and therefore is not limited to the lowest but extends up along the ladder of evolution to the highest of the vertebrates in the animal kingdom.

The creatures over the earth have always been exposed and will remain exposed to natural sources of ionising radiation. But the danger that looms large, is not due to the nature of the hazard but the ever increasing quantity and that is new.

The harmful effects of radiations may manifest in the form of superficial injuries or general effects as acute radiation syndrome, radiation sickness, haematological hazards in the form of aplastic anaemia, haemorrhagic episodes and leukaemia, induction of malignant growths, production of cataracts and reduction of life span. Alteration of the states of polymerisation and degree of viscosity, denaturation of proteins, inactivation of the enzymes, breaking up of the chromosomes and altering their arrangements and changes in the genes are some of the intracellular effects of radiation.

The germinal cells are extremely sensitive elements histologically or cytologically. Far reaching is the effect of radiation on the germ cells. Structural alterations of the chromosomes produce "chromosome aberrations"[2]. The chromosome effect is dependent on the dose rate and acuteness of exposure requiring only a few roentgens.

The immediate deleterious effects of radiation on the gonads have been observed in Hiroshima. There were cases of sterility, miscarriages and stillbirths. Eleven children born in post-atom bomb period had partial failure of the development of the brain.

Radiation will cause acceleration of evolution. Will this acceleration cause genetic deterioration, extinction or betterment of the species? Speculations on the hazards of exposure to radiation from the genetic point of view has been excellently discussed recently[3].

The single most important factor which emerges from all discussions is that the effect of radiation on genes is additive. The accumulated dose and not its intensity or duration of application, is responsible for the frequency of mutation. Moreover mutation of genes occur only when the gonads absorb the radiation and not when other parts of the body are exposed to it, and the effect is more harmful on the mature germ cells. All the radiations received during the reproductive period will have therefore to be taken into consideration to calculate the possible gene changes that will be passed on to the last child yet to be born. So far gene changes are concerned the effect will be the same whether radiation received by the gonads is at the rate of 0·3 r per week for 10 weeks a year for 10 years, or at the rate of 30 r per minute for a minute only.

Based on the present day knowledge of genetics, evolution and biological phenomenon, it will not be wrong to infer that blind mutational changes without regard to the end results due to unadapted additive radiations are not only not beneficial but detrimental for man.

At present it is unlikely that mutations would cause a distinguishable effect in this generation or the next resulting in premature death, or failure to reproduce. Again for each mutation drastic enough to be recognisable in the first or second generation, there will be hundreds of others with effects too small or too hidden to be seen. A man born with a damaged gene may have a slight effect, but if he marries a woman with a damaged gene, the child will show the effect more conspicuously. The handicap will not only go down the line of descent but also grow to be a major permanent handicap in future generation 100 or 1000 years

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[3] KEOSIAN, J.—*Science*, **122** : 586, 1955.

after when all the traces of the line of descent and the stage when the first minor handicap occurred will have been lost.

With the advent of the atomic age the ionised radiations coming out of man-made sources are rising far above the natural level. A population that is exposed, generation after generation, to an increasing amount of radiation will experience a rising death rate and a falling birth rate because of the harmful mutations until a new equilibrium is established by the process of adaptation. If the process of adaptation fails and death rate exceeds the birth rate, the population will decline and eventually perish.

Since August 1945 when atom bombs were first exploded in Hiroshima and Nagasaki, we have been thinking in the terms of obliteration of cities and wiping out of population by blasts and heat. This is but a minor effect *vis-à-vis* the damage to posterity which may be caused by irradiation.

Recent competitive test explosions by far more powerful thermonuclear devices have concentrated the attention of the scientists to the problem of radiation hazard. The thermonuclear weapons being the enormous potential sources of contamination, appeals have been made to all nations experimenting with these devices not only to renounce them as weapons of war but to ban even the test explosions. Even if the abolition of the nuclear weapons is taken for granted, a very remotest possibility, it will be just a step towards the control of universal radioactivity. The peaceful use of the atom in industry is developing by leaps and bounds. More radio-isotopes are being used in laboratories and hospitals, more million volt x-ray apparatuses are being installed and more nuclear reactors are operating now. The radioactivity of wastes will outlast the average life of a reactor by several centuries. A large atomic power plant blow up will cause a major disaster. By the end of this century the operating reactors will have so much strontium 90 that dispersal of only 1 per cent of it would cause serious contamination of the entire earth[4]. At present the effect of atomic radiation on the genes of man is a lesser hazard than the use of x-rays. However small the radiation may be, any high energy radiation even if of low intensity and brief duration is potentially dangerous from the genetic and hereditary points of view.

The biggest problem a medical man has to face is to estimate what amount of radiation may a person be exposed to without damage to himself or the future generation, that is to find the "maximum permissible exposure". Norms have been set up from time to time with a downward revision of values. Though the present recommendation[5] of the norm is 0·3 r (air) per week, i.e., 0·05 r per day, we are not convinced that this is valid on the long term genetic view.

India will have to face these problems soon because of the setting up of a nuclear reactor. Such problems include adequate and safe disposal or utilisation of the radioactive wastes. At the present moment exposures from x-rays industrial or medical, of whatever power, may cause more genetic changes than a lifetime work with radiation. It is therefore imperative that uncontrolled, unsound and ill planned installations of unnecessary sources of x-radiation whether experimental, diagnostic or therapeutic, must be abolished. An all-India body may immediately be set up by the Health Ministry with the help of the I.M.A. to supervise the designing and layout of installations and to check whether adequate protecting measures[6] have been taken and are being followed. The body must also see that it is only the qualified who are allowed to instal and run an x-ray apparatus.

Even if a country has controlled its own sources of radioactivity and has no thoughts of producing nuclear weapons, it will still have to face radiation hazards because of nuclear tests by its neighbours. Explosions near the ground or under water always sends radioactive particles into the upper air, which ultimately sink and settle on the earth's surface as deadly dust or rain. The fall-out contaminates air and water not only of the particular area but thousands of miles away. Radioactive strontium, one of the constituents of this fall-out retains its radioactivity for a long time. Absorbed in the human bones it causes cancer. Very recently, in Calcutta, which is a far cry from Bikini, Monte Bello or Siberia, radioactivity has been detected in many common vegetables and milk. Just following a thermonuclear explosion radioactive nuclei were detected in the rain-borne dust deposits on the rooftops. It is suggested that the vegetables have absorbed this contaminated rain water and have become radioactive. Milk has shown radioactivity due to contaminated grass being used as fodder. It is hoped that intake of these contaminated foods and milk will have no deleterious effect on the human system because of its very negligible quantity.

Our biological species has had a remarkable history and it is not desired that slow torture of disease, deformity and disintegration of the survivors happen.

[4] *Time*, 25th June, p. 36, 1956.

[5] International Recommendation on Radiological protection—*Radiology*, **56** : 431, 1951.

[6] PETERS, H.—*J. Indian M. A.*, **27** : 53, 1956.

CURRENT MEDICAL LITERATURE

Prednisone in Systemic Sclerosis

RODEN AND OTHERS (*Ann. Int. Med.*, **44** : 26, 1956) write :

A new synthetic steroid, prednisone, has been administered to six patients with progressive systemic sclerosis (diffuse scleroderma) in oral doses of 20 to 30 mg. per day for uninterrupted periods of up to four and one-half months. All patients experienced improvement in the skin, with diminution in hyperpigmentation, swelling and tightness, commencing approximately one week after onset of treatment. Prednisone displayed potent antirheumatic activity in two patients with joint involvement; relief of pain, tenderness and swelling followed within one day of therapy. One patient with pulmonary involvement in ventilatory capacity. Gastrointestinal manifestations were not improved.

In all patients the sedimentation rate was reduced and the C-reactive protein, when present, disappeared. Only slight changes were noted in the concentration of the serum protein fractions. The hematocrit increased in one patient.

Thus far, untoward side-effects have been minimal.

Treatment of Liver Disease

TULLIS (*Ann. Int. Med.*, **44** : 133, 1956) in dealing with what is important in the treatment of liver disease writes :

The most important features in the treatment of liver disease are rest and the successful administration of a high protein, high caloric diet.

In acute infectious hepatitis, bedrest with bathroom privileges should be observed at least until there is evidence of diminishing bilirubinemia, and preferably until the one minute serum bilirubin is 1·0 mg per cent or less. In chronic liver disease, similar bed-rest probably should be continued as long as the patient is showing evidence of improvement.

While adequate caloric intake alone will provide improvement in liver disease, the most striking improvement in chronic liver disease results from a high protein intake over a period of many months to combat the serious nitrogen depletion. Alcohol should be omitted entirely Vitamins, lipotropic agents, testosterone and adrenal hormones offer no additional advantage in average cases of liver disease.

The complication of ascites can be managed best by strict sodium restriction in addition to the basic treatment program.

The clinician should be alert to the earliest signs of impending hepatic coma : mental disturbance and characteristic tremor. Protein should be administered with caution in such instances, and corticotropin and cortisone may be beneficial.

Massive haemorrhage from varices of the upper gastrointestinal tract deserves definitive surgical therapy in most instances to ward off subsequent fatal haemorrhage.

Vitamin B_{12} in Dermatitis

PEISER (*Dtsch. Med. J.*, p. 519, 1955, Ref. *German M. J.*, **1** : 33, 1956) in dealing with the therapeutic importance of vitamin B_{12} in certain kinds of dermatitis observes :

120 patients with various kinds of dermatitis were treated with large parenteral doses of vitamin B_{12}. Generalized dermatitis appeared to respond best, the general state of health improved, itching abated, and in over 85 per cent of the cases all symptoms subsided noticeably. Localized eczemas were in most cases eliminated, at least in part. These eczemas, found predominantly in the face and on the hands, were usually difficult to influence with general measures. Some cases of chronic urticaria, which did not respond to calcium treatment, also showed improvement. B_{12} did not have such a favourable effect on seborrhoeic dermatitis. But in two cases, which were accompanied by bronchial asthma, the attacks of asthma were noticeably reduced in number. Sixteen patients with herpes zoster responded more favourably to a combined treatment of vitamin B_{12} with procaine and nicotinic acid than to B_{12} alone. No improvement was obtained in two cases of pemphigus vulgaris and one of pemphigus foliaceus. Nor were the results of the trearment absolutely clear in two cases of mycosis fungoides. In the beginning, the daily intramuscular dose generally was 1,000 γ of vitamin B_{12}. After some time it was possible to reduce the dose gradually to 500 γ 2 or 3 times a week. The average total dose usually amounted to 5,000 to 6,000 γ of vitamin B_{12}. No secondary effects appeared even if 25,000 γ were given. On the contrary, the general state of health improved in almost every case.

Systemic Reactions to Mercurial Diuretic

SMALLWOOD AND OTHERS (*Lancet*, **1** : 121, 1956) report that 4 patients had systemic toxic reactions to subcutaneous injections of mercaptomerin ('Thiomerin'). The reactions did not appear to differ from those induced by other organic mercurial diuretics given by other routes.

The reactions in these 4 patients were of two types : in the first 3 they appear to have been allergic, while in case 4 the haemorrhagic colitis is most easily explained by excretion of metallic mercury through the wall of the gut—a well-recognised sequel of poisoning with inorganic mercury.

Penicillin V

Various penicillins with different properties have been produced by changing the strain of the fungus, the conditions of growth, and the composition of the medium. So far, penicillin G has been the most widely used. A new type of penicillin, penicillin V, or phenoxymethyl penicillin, has been produced by biosynthesis by growing *Penicillium chrysogenum* Q176 in a culture medium containing a special type of nutrient. Being an acid and acid-resistant, penicillin V passes through the stomach unchanged, unlike penicillin G, which is partially inactivated by acid, and is largely destroyed by the acid gastric juice if taken by mouth. Oral absorption of penicillin G is variable and much larger doses must be

given by mouth than by injection. Penicillin V is stable as the free acid, and, unlike the other penicillins, need not be prepared as a metallic or organic salt. It is dissolved and absorbed unchanged in the alkaline medium of the small intestine, and is, therefore, eminently suitable for oral administration. Broadly speaking, its antibacterial spectrum is identical with that of penicillin G, but it is said to be 60 per cent more active than the latter against *Staphylococcus aureus*. The two penicillins also differ slightly in their activity against *Micrococcus pyogenes*. Because of slight quantitative differences in their action on the test organisms in biological assay the dose of penicillin V is best assessed by weight in mg. and not in units. 60 mg. of penicillin V is equivalent to 100,000 units of penicillin G by chemical assay.

After penicillin V has been given by mouth, the blood-levels are higher and more sustained than those produced by an equivalent dose of penicillin G. An oral dose of 120 mg. (200,000 units) of penicillin V gives detectable blood-levels six hours after administration, although the level declines after four hours. If this quantity of penicillin G is given orally, the blood-level is approaching zero after six hours. The recommended dose of penicillin V is 120-240 mg. every four hours round the clock; but for convenience the last night dose can be doubled to avoid awakening the patient in the night. About 25 per cent of an oral dose of penicillin V is excreted in the urine. It is more sensitive to penicillinase than penicillin G, and therefore any that is unabsorbed when taken by mouth is destroyed in the lower part of the gut by organisms producing penicillinase. Like penicillin G, penicillin V does not readily penetrate the blood-brain barrier in normal subjects. It is possible, however, that it may traverse it if the meninges are inflamed; just as penicillin G does. Therapeutically effective amounts of penicillin V have been found to diffuse into the pleural and peritoneal cavities, and to be excreted into the bile.

In the treatment of mild to moderate infections due to susceptible organisms, 120-240 mg. of penicillin V every four hours has been found effective. If the infection is severe, it may be necessary to use a higher dosage (e.g., sensitivity seem just as likely with this new penicillin as with penicillin G). Gastro-intestinal irritation with loose stools, no doubt due to altering the balance of the intestinal flora, has been reported. Preliminary reports with penicillin V in this country have been encouraging and trials in Germany and Austria have shown its value by mouth, particularly in children. It may be that many of the infections that have been treated with penicillin parenterally in the past may now be treated with penicillin V orally. In conditions in which higher blood-levels are needed (bacterial endocarditis, for example) the simultaneous administration of probenecid is an advantage.

At the Annual Symposium on Antibiotics held in Washington last November a speaker from Sweden said that 40 per cent of the penicillin used in his country was now in the form of penicillin V tablets, and another speaker said that in Austria 30 per cent of all the penicillin administered was given as oral penicillin V. (Annot. *Lancet*, **1**: 272, 1956).

The Electrocardiographic Pattern of Right Ventricular Hypertrophy in Chronic Cor Pulmonale

SCOTT AND OTHERS (*Circulation*, **11**: 927, 1955) from the analysis of the observations on twenty-eight patients with pulmonary hypertension secondary to chronic lung disease studied by cardiac catherisation point out:

Thirteen patients did not show the electrocardiographic pattern of either right ventricular hypertrophy or right bundle branch block; 15 patients showed right ventricular hypertrophy and/or right bundle branch block (complete or incomplete).

A statistically significant difference was demonstrated between the means of these two groups for the following physiological measurements: mean pulmonary artery pressure, total pulmonary resistance, arterial oxygen saturation, and right ventricular work.

All cases except one with the pattern of right ventricular hypertrophy had a mean pulmonary artery pressure greater than 30 mm. Hg.

All cases whose total pulmonary resistance exceeded 750 dynes/second/cm. showed the electrocardiographic pattern of right ventricular hypertrophy or right bundle branch block (complete or incomplete).

The development of the pattern of right ventricular hypertrophy in patients with chronic cor pulmonale usually indicates an advanced state of the disease.

Sex Hormones and Circulating Lipids and Lipoproteins

OLIVER AND BOYD (*Circulation*, **13**: 82, 1956) write:

The administration of ethinyl estradiol to men with myocardial infarction decreased the plasma total cholesterol, elevated the plasma phospholipids thereby depressing the total cholesterol-phospholipid ratio and decreased the concentration of cholesterol attached to the beta lipoprotein fraction.

A daily dose of more than 200 μg. of ethinyl estradiol was no more effective in its influence on the circulating lipids and lipoproteins and was regarded as a disadvantage, as it was more readily associated with feminising side effects.

Hexestrol and estradiol had a similar but less marked effect.

Ethinyl estradiol and methyl testosterone had a mutually antagonistic action on the circulating lipids and lipoproteins.

Progesterone had no significant action on the circulating lipids and lipoproteins.

Methyl testosterone and ethinyl testosterone failed to relieve the side effects of ethinyl estradiol administration.

The efficacy of ethinyl estradiol administration in coronary disease must await assessment in terms of morbidity and mortality rates, rather than in its ability to correct the abnormal circulating lipid and lipoprotein concentrations.

CURRENT TOPIC

THE INTERNATIONAL UNION AGAINST TUBERCULOSIS, PARIS

Tuberculosis got international recognition from 1889 when a Central International Bureau for the Prevention of Tuberculosis was formed with headquarters in Berlin. Seven Congresses were held in the various countries of Europe and America under the auspices of this Bureau. The first world war, however, interrupted its activities, but it was reorganised in 1922 with its new name as the International Union Against Tuberculosis and with headquarters in Paris. Under the auspices of this Union, biennial congresses were held in Oslo, the Hague, Warsaw and Lisbon in the thirties with annual meetings of the Council in Paris in the intervening years. A quarterly bulletin was also being published. But the Second World War made it impossible for the Union to continue its work. It was revived in 1946.

The International Union has at present 55 members, the National Tuberculosis Associations of the various countries forming the membership. The Union is largely financed by its affiliated bodies. With this it was able to have a small Secretariat which arranged the conferences and published the bulletin. Since 1948 it has been possible to reorganise its work and secure increased contribution from member associations. The Government of France is giving some subsidy to this Union. The International Congress which will be held in India in 1956-57 is the fourteenth of its kind under the auspices of this Union.

Till 1949 the policies and work of the Union had been practically guided by those in the West and the subjects for discussion in conferences related mainly to Western countries. Recently it became possible to modify its outlook with a view to considering TB as an international problem. The establishment of the World Health Organisation as a special agency of the United Nations in 1946 also influenced the Union's programme. On the other hand, it should be said that the International Union was partly responsible for the World Health Organisation to pay attention to tuberculosis as a world problem from its very beginning. This necessitated the revision of the programme of the International Union in the new set up. There were some who doubted whether the Union should continue to function at all. After careful consideration it came to the conclusion that since W.H.O. is an inter-governmental organisation, there is need for a non-official agency like the International Union. It was also agreed that the special function of the International Union should be so conceived as to supplement the work of W.H.O. and other Government organisations. This could be especially in the field of creating public interest in the tuberculosis problem in the various countries by assisting their national Associations to organise effectively for this purpose. This meant the setting up of a more active organisation at the Headquarters of the Union. From 1952 an Executive Director has been appointed and the Secretariat of the Union enlarged.

After this re-organisation, the Union has set up several special Committees to advise on different aspects of TB control programmes. There are at present special Committees on Health Education, Epidemiology, Occupational Therapy, Rehabilitation, Mass Radiography, Laboratory Methods, B.C.G., Antibiotics, Collapse Therapy and Chest Surgery. In addition to this the Union is advising through its accredited representatives some of the National Associations. Mention may be made in this connection of the survey done in Spain and advice given to the National Association there by Dr. Esmond Long, who was deputed by the Union for this purpose. On a request from the Nepal TB Association, the Technical Adviser of the Tuberculosis Association of India, who is also a member of the Executive Board of the Union, was deputed to give his advice on TB problem in that country.

During the last six years the Union has emphasised the need to deal with the tuberculosis problem in the under-developed countries of the world. It is now recognised that tuberculosis is not so much a problem in the western countries where it is more or less controlled, but that the attention of the International Union as well as other agencies interested in tuberculosis work should be focussed mainly on the countries of the East, Africa and South America and the decision to have the next Congress in India was largely influenced by this consideration.

NOTES AND NEWS

International Conference on Tuberculosis

The 14th International Conference on Tuberculosis under the auspices of the International Union Against Tuberculosis and the Tuberculosis Association of India will be held in New Delhi from the 7th to 11th January, 1957. This Conference has been invited to India with the concurrence of the Government of India. The International Union has nominated Rajkumari Amrit Kaur, Union Minister for Health and President of this Association, as Honorary President of the Conference and Dr. P. V. Benjamin, Tuberculosis Adviser to the Government of India and Technical Adviser to the Tuberculosis Association of India, as its President.

The Conference is likely to be inaugurated by the Prime Minister of India. The Government of India have allowed the use of the Conference Hall which is under construction in King Edward Road, New Delhi, for holding this Conference. This hall will have arrangements for simultaneous interpretation, ear phones, etc. About 400 delegates from different parts of the world and about 500 from India are expected to attend the Conference.

This will be the first international congress on tuberculosis to be held in the East, all previous conferences having been held either in Europe or in America. This Conference will provide an opportunity for tuberculosis workers not only to come in contact with each other, but also to discuss their problems with

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specialists of other countries where tuberculosis has been largely controlled. Papers on the different aspects of tuberculosis problem, such as (1) "Diagnostic and Biological Problems of Isoniazid Resistant Tubercle Bacilli", (2) "Clinical and Epidemiological Results of Ambulatory Chemotherapy in Pulmonary Tuberculosis", and (3) "The Incidence of Tuberculosis in Economically Under-developed Countries and the Methods for Evalnating it", will be read and discussed in this Conference. There will also be symposia on (1) Value of tuberculin reactions for the selection of cases for B.C.G. vaccination and significance of post-vaccination allergy, (2) The importance of nutritional factors in tuberculosis, (3) Cortisone in the treatment of tuberculosis and (4) Role of voluntary tuberculosis associations in tuberculosis control programmes.

The Tuberculosis Association of India, as the host, is making necessary arrangements for holding the Conference. Various Committees for different items of work such as registration and reception of delegates, accommodation and transport arrangements, entertainment, exhibition, visits to institutions, etc. have already been formed.

The Indian Medical Association has been invited to send an adequate number of delegates to this Conference.

International Congress of Radiology

The issue of vegetables and certain items of foodstuff getting radio-active in Calcutta area in the wake of the recent nuclear tests by Britain and America is likely to echo at the eighth International Congress of Radiology due to be held in Mexico from July 21 to July 31 next.

Dr. N. B. Roy, Professor of Radio-therapy at Calcutta Medical College, who will represent India at the Congress, is currently busy collecting relevant data to enable him to raise the issue there.

Dr. Roy will also be invited to address a symposium at the conference of the International Radio-therapy Club in Mexico on July 30.

Central Aid for Tuberculosis Hospitals

The Union Ministry of Health, it is understood, has placed Rs. 6,32,270 at the disposal of various State Governments for the maintenance of 393 free beds reserved in various TB hospitals and towards financial assistance to indigent displaced TB patients from West Pakistan during the current financial year.

The States to benefit from the fund are Saurashtra, Vindhya Pradesh, Kutch, U. P., Madhya Pradesh, Bhopal, Rajasthan, PEPSU, Madhyabharat, Punjab, Bombay and Ajmer.

The work relating to the grant of relief to destitute TB patients displaced from West Pakistan was taken over by the Ministry of Health from April 1, 1955, from the Ministry of Rehabilitation.

Society for the Study of Industrial Medicine, India

The 7th All-India Conference of the Society for the Study of Industrial Medicine was held at Madras on 18th, 19th, 20th and 21st February, 1956.

Minister Shri M. Bhaktavatsalam during his inaugural address said that the E.S.I. scheme was working satisfactorily in Madras State. In Coimbatore, Panel System was already working and in Madras, Service System was started recently. Both the systems are being watched.

Dr. A. D. Daftary of Bombay in his presidential address stressed on the uniform panel-system in the country as it was recognised to be the best suited to social security-plans by the World Medical Association at its 7th Annual Meeting at Hague. He also suggested the removal of shortcomings and drawbacks of the scheme such as overcrowding at diagnostic centres by opening more centres and working in double shifts, increases in hospital beds and x'ray and laboratory and ambulance facilities, reduction of clerical work for doctors, review of capitation fees at the end of 2 years, Provident fund and leave rules should be applicable to Panel-Doctors.

He also put great stress on retaining and strengthening of factory medical service along with Industrial Health Service as much of constructive, preventive and educative work could be taken up by industrial physicians, the curative work being taken over by Panel-Doctors.

He offered the services of the Society and its members to Central and State Governments and I.M.A. for any problem pertaining to Industrial Medicine.

There was a symposium on E.S.I. Bombay scheme in which Dr. A. D. Daftary, Dr. S. K. Das, Dr. Leela Krishnan and Dr. P. K. Ghosh participated.

Indian Doctors in Malaya

A letter over the signature of R. B. Sundaram of Bidor (Malaya) published in *the Hindu*, Madras, on 13-6-56, states that it was decided in 1951 to offer permanency to 30 Indian doctors on contract but the present policy of the Malayan Government is not to offer permanency to those on contract as it will "prejudice the prospects of locally domiciled persons qualifying at the University of Malaya or overseas of whom there are approximately 470 likely to qualify during the period 1956-60" (the Chief Secretary's reply to Mr. Devaser's question in the last Federal Council Meeting). A further clarification regarding chances of permanency for Indian doctors arose recently due to the resignation of an Indian doctor when the Government spokesman made it clear that "it is against the general policy to give permanent employment to persons who are not Federal citizens." Thus, permanency for those on contract is only a bait that is offered to attract recruits from India.

A recent statement by the Minister for Health in Malaya makes the position of Indian doctors clear. According to him, Indian doctors will man the outlying hospitals in East Coast States and the leper and mental hospitals as "our local medical officers do not like to be transferred there". Thus, it would seem that doctors from India are given a Cinderella-like treatment here. It is worth mentioning that they do not get many of the privileges freely given to those recruited from

the U.K. and other Commonwealth and European countries, such as expatriation pay, free passage to and from Malaya and special leave conditions. It may be that the Indian Government may find it appropriate to take necessary steps for ensuring equal conditions of service, etc., and if necessary, insist on recruitment through their own Governments as is being done in the case of other Commonwealth countries.

The Henry Simpson Newland Prize in Surgery

The Henry Simpson Newland Prize in Surgery, established to commemorate the services of Sir Henry Newland to the medical profession, is open for competition. The conditions are: The Prize shall be awarded every three years to the writer of the essay adjudged to be the best on a surgical subject. It will consist of a money award of One Hundred Pounds (100), together with a medal. The next award will be made in 1958, the subject of the essay being: "Factors Influencing the Prognosis in Acute Intestinal Obstruction."

The dissertation should be based on personal observation and experience. The essay must be typewritten or printed in English. It must be distinguished by a motto and accompanied by a sealed envelope containing the name and address of the author and having on its outside the corresponding motto. It must not exceed 50,000 words. It must be delivered to the General Secretary, Federal Council of the British Medical Association in Australia, 135 Macquarie Street, Sydney, not later than 23rd November, 1957. Any graduate of any medical school within the British Commonwealth can compete.

Colonel Amir Chand Trust Prizes for Medical Research

Six prizes, of almost equal value, of which some may be in the form of medals, are awarded annually on an All-India basis for the best published research work in any subject pertaining to all fields of medical sciences in general including clinical research. The term, "Clinical Research" will imply research into the mechanism and causation of disease, including its prevention and cure. It covers not only work in patients in hospitals, but also field studies in epidemiology and social medicine and observations in general practice. Three of the prizes are known as, "Basanti Devi Amir Chand Prize" and the other three, "Shakuntla Devi Amir Chand Prize".

Two out of the six prizes shall be awarded to graduates of not more than ten years standing, counting from the date of graduation, provided that the work for which the prizes are to be awarded is of approved merit. The competitors for the prizes may be medical or non-medical graduates.

It has been decided to award during 1956 six prizes of the value of Rs. 300/- each for the best research papers in medical science published by workers during the year 1955 (1st January to the 31st December, 1955).

The award of the prizes will be announced at the annual meetings of the Scientific Advisory Board and the Advisory Committee of the Indian Council of Medical Research, to be held at Mysore in November/December, 1956.

The candidates are required to submit 10 reprints of their papers published during 1955. These should be sent to the Indian Council of Medical Research, "P" Block, Raisina Road, New Delhi, so as to reach him not later than the 1st August, 1956. The papers should be accompanied by a short biographical sketch and two copies of passport size photographs of the worker or workers concerned.

Raptakos Medical Research Board Fellowship

The Raptakos Medical Research Board will consider applications for the award of fellowships for research work on medical and allied subjects in recognized institutions situated in the Union of India.

The awards normally consist of Rs. 3,000/- per year for a Fellowship and Rs. 750/- per year towards special equipment or chemicals approved by the Board.

Applications in the prescribed form, which may be obtained from the Secretary and Treasurer, should be forwarded through the Guides, under whom research work will be carried out, and the Heads of the Institutions.

Each application should be accompanied by six copies of a brief statement of the research project and the comments of the guide regarding the suitability of the project and the facilities existing at the Institutions.

Applicants should have an M.B.B.S. or M.Sc. degree or its equivalent or not less than two years' experience in research work after B.Sc. The awards are made annually and may be renewed on the basis of satisfactory progress.

Applications for grants for the year commencing January 1, 1957 should reach the Secretary and Treasurer, Raptakos Medical Research Board, Dr. Annie Besant Road, Worli, Bombay 18, before September 1, 1956.

CORRESPONDENCE

The Editor is not responsible for the views expressed by correspondents

Toothbrush and Tooth Paste

SIR,—It is common knowledge that in India, particularly in the countryside, twigs of various plants and trees are used as efficient cleanser of teeth. Some of them have astringent taste and effect which impart a fresh and healthy feeling to the gum and the mucous membrane of the mouth. Besides, there are various countrymade tooth powders, ayurvedic and otherwise, consisting of cheap and effective indigenous drugs and chemicals which can be used without a toothbrush for cleansing the mouth effectively and economically.

These tooth powders usually contain things like myrobalan and nuts, containing tannin and certain orga-

nic acids, pepper, cinnamon, camphor in a charcoal or calcium carbonate vehicle. The organic vegetable acids particularly those of myrobalan dissolve the calcium phosphate or tartar deposited on the teeth and gum more effectively than do tooth pastes. These astringents particularly those of *Haritaki, Amlaki* and *Bahera* are very good for sensitive and bleeding gums.

Toothbrush and tooth paste are the fashion of the day. Few of these are really good and conform to scientific requirements. Even amongst the educated and cultured people, there are not many who care to preserve the tooth brush after thoroughly cleaning it in a suitable antiseptic lotion. The result is often disastrous and it causes a self-inflicted auto-infection of the mouth and gum when the brush, teeming with micro-organisms which had been growing there since the last application, is used the next time.

The question "Why use tooth paste?" cannot, of course, be answered, until a bureau of standards which has scientifically investigated dentifrices is courageous enough to publish proven evidence for or against the claims of the manufacturers. The American Dental Association has shown no compunction to disproving such claims when it sees fit, nor in giving cautious hope for dentifrices containing stannous fluoride; but here, where dentistry is the concern of a Welfare State, the matter has not been given official attention. Until dental practitioners are told by a competent authority what, in fact, people will gain by using dentifrices, and which ones to use, they can but shake their heads in sorrow over all those unregenerate folk who never buy any at all. In the hands of most people a toothbrush is of little more value than a dentifrice. Handled, as it mostly is, without skill or thought, it effectively rubs into the gums it has often lacerated such putrefying debris as it may have dislodged from the teeth.

I would, therefore, ask the learned members of the medical profession to give serious thought to this problem of exaggerated claims of manufacturers in the use of toothbrush and dentifrices, which is indeed a large and vital one, not only from the point of view of oral hygiene but also from the economic point of view.

I am etc.,

Calcutta. (MRS.) T. SOLOMON, L.D.SC.

REVIEWS

Outline of Orthopaedics—By J. C. Adams, M.D. (LOND.), F.R.C.S. (ENG.), E. & S. Livingstone Ltd., Edinburgh and London, First Edition, 1956, 5½ ×8½, pp. vii+425, price 32s. 6d.

Since the time of Nicolas Andre, who a little over two centuries ago coined the term and published his book *Orthopaedia*, the scope of orthopaedics has undergone a revolutionary change. At first considered a branch of preventive medicine it has now become a full-fledged branch of surgery, studied and practised as a speciality. Even for the undergraduate student it now covers a considerable slice of surgery but there are not many suitable text-books for them in this subject.

The present work, though primarily intended for the undergraduate, contains, in a concise form, a wealth of uptodate information sufficient not only for undergraduates but also for young graduates and private practitioners for whom it may safely be recommended as a text-book.

Psychopharmacology—Edited by Nathan S. Kline. Published by American Association for Advancement of Science, Washington, 1956, 5½" ×8½", pp. 165+x, price $3.50.

This symposium deals with several new pharmaceutical drugs used in the field of mental diseases. Contributors have focussed their attention mainly on chlorpromazine and reserpine and there is also a discussion on mescaline, serotonin and related drugs. Chlorpromazine has produced good results in all varieties of mental diseases except depression. The American authorities prefer to use it in huge dosage such as 250-2400 mg. at the peak point. Undermedication gives rise to mental distress and dysphoria instead. Principal side-effects are drowsiness, hypotension, hypothermia, dryness of the mouth, pseudoparkinsonism and dermatitis in a few cases and rarely jaundice. Autonomic nervous activity is depressed. The drug probably depresses the thalamohypothalamodiencephalic region. It offers a short cut to cure and it facilitates psychotherapy. Lobotomy should not be contemplated until an adequate trial has been given to this drug. None of the authors have said anything about tachycardia which is a noticeable distressing feature in so many cases treated with chlorpromazine.

Reserpine, the active principle of the root of the Indian shrub *Rauwolfia serpentina* is effective in the treatment of such mental conditions as manic-depressive psychosis, anxiety and obsessive states, hyperkinetic and agitated confusional psychoses. It reduces thought association and resistance and induces volitional reduction by acting primarily on the brain. It does not produce drowsiness which is such a prominent feature of barbiturates and other standard sedative agents. This drug has caused a significant advance in psychiatry. With its use more patients are now amenable to effective psychiatric rehabilitation than before. The drug exerts its action after a certain amount of accumulation in the body. It may give rise to dizziness and tremulousness. Nasal stuffiness, loose stools, fatigue and lessening of sexual drive and Parkinsonism are other side-effects. Injection of eyes is also frequently noticeable (not mentioned in the papers). A dose of 1 mg. of reserpine or 500 mg. of the whole root was equally effective. It is gratifying to note that the editor of the symposium found improvement in 84 per cent of the disturbed psychotics who had failed on electro-shock and insulin coma-treatment and that 70 per cent of the said patients, maintain the improvement after medication is discontinued. The use of reserpine facilitates the management and nursing care of the patient. This drug is also beneficial to those patients who have mental symptoms associated with hypertension. If necessary electrotherapy may be

resorted to with reserpine or chlorpromazine. Reserpine acts by decreasing the sympathetic activity and hence the slowing of the heart-rate.

Chlorpromazine antagonises the effects of mescaline. Serotomin is a substance known to be present in the central nervous system. There is a suggestion that some psychotic disorders are produced by a disturbance in adrenalin or serotomin metabolism. All these discussions are likely to stimulate further research in the pharmacodynamic aspects of mental diseases. Investigators will find in this symposium a source of information for future work in newer drugs and for increasing their knowledge they might turn to the elaborate references at the end of each chapter.

OBITUARY

Dr. Amulya Charan Ghosh

Dr. Amulya Charan Ghosh, M.B., a senior physician of Bhagalpur practising in the town for over 36 years breathed his last on June 12, 1956, after a brief illness. He was 61 years at the time of his death. Dr. Ghosh was a Commissioner of the Bhagalpur Municipality for

DR. AMULYA CHARAN GHOSH.

many years and was the president of the Bhagalpur branch, I.M.A. for 3 years. He was a very popular medical practitioner who was reputed for his kindness towards the poor.

May his soul rest in peace!

YOUR QUESTION

Correspondents should give their names and addresses (not necessarily for publication) and include all relevant details of the questions which should be typed. Questions of medical interest only will be accepted for this section. They should be sent in a separate envelope marked "Your Questions." Questions of general interest will be published in preference. Lack of space precludes answering of all questions received.

Q. Can chlorpromazine be administered continuously and if so for how long? What dosage can be given to a lady weighing 132 pounds? What are the earliest symptoms of intolerance? If intolerance is shown after a time, can administration be resumed after an interval?

Ans. Chlorpromazine is now-a-days used extensively in mental cases, the best indications for its use are maniacal excitement with restlessness, agitated depression of the involutional age period and confusional states of chronic schizophrenia and drug addiction. Elderly patients respond better to this drug than comparatively younger patients. Further the intensity of paranoid delusioned ideas become less after the use of the drug for sometime.

1. The drug can be used continuously for a period of three or four months at a stretch, in those cases who do not show any sign of intolerance.

2. To start with smaller dosage such as one tablet (25 mg.) b.d. may be used. The dose can then be increased gradually to two or three tablets b.d. Larger doses however do not produce any additional benefit to the patient. On the contrary, if each dose of chlorpromazine is combined with a small dose of phenobarbitone (gr. ¼) excitement and agitation subside more quickly.

3. Symptoms of intolerance are the following:

Tachycardia, the rate of the heart may increase to 90 or 100 per minute or more even with such a small dose as 1 tablet b.d. Some patients complain of dryness of the throat. They feel thirsty and they drink large amounts of water. Lethargy, drowsiness, and depression sometimes appear and then the drug has to be discontinued. Skin rashes may sometimes appear to complicate the issue. When the drug is administered for a prolonged period it is better to have the blood count done from time to time. There may be some increase in the number of eosinophilic cells. Some patients tend to become obese and they gain weight after its administration for a few days. The drug should be administered with caution if there is a tendency to hypertension. In the latter event simultaneous administration of some Rauwolfia preparation may be helpful. The drug may produce a feeling of nausea, occasionally. When the drug is used in combination with Rauwolfia, it may give rise to the syndrome of Parkinsonism. All these untoward symptoms disappear promptly on discontinuation of the drug for a few days.

4. The administration of the drug can be resumed in a smaller dosage after a certain time in cases of intolerance and with a suitable dosage scheme it has been found to produce a beneficial result.

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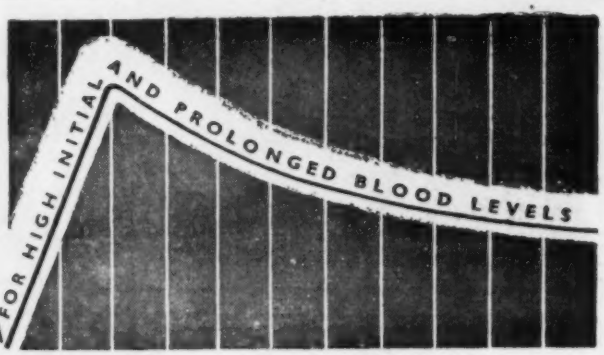

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VI HYDERABAD STATE MEDICAL CONFERENCE, GULBARGA, 1955

The 6th Hyderabad State Medical Conference was held at Gulbarga on the 4th and 5th December 1955, under the auspices of the Hyderabad State Branch of the I.M.A. About 250 doctors from all over the Hyderabad State and 500 distinguished citizens of the city attended the inaugural session of the conference held on the 4th December 1955.

Nawab Mehdi Nawaz Jung, Minister for Medical and Health and Rural Reconstruction, Dr. G. S. Melkote, Minister for P.W.D. and Labour, Dr. Chenna Reddy, Minister for Planning and Agriculture, Shri M. Vasudave Rao, I.A.S., Collector and President I.C.S.W., Dr. L. D. Khatri, Director, Medical and Health Services, Hyderabad and all the past presidents of the Hyderabad Pradesh Branch, were prominent among those who occupied the dias.

Dr. L. R. Deshpande, Chairman of the Reception Committee, accorded a hearty welcome to the delegates and guests to his city Gulbarga named after a bunch of flowers where spiritual cults of divergent nature attained by famous saints like Shri Chan Basweshivar the founder of the Veer Shaiva Cult, Shri Jaitiratha the great exponent and interpreter of the Madhwa philosophy and the Durgah of the illustrious Soofi Saint Khaja Bande Nawaz of Muslim gratitude flourished hand in hand.

In his address he reviewed the activity of alround progress of Medical and Public Health Department and paid glowing tribute to persons who are at the helm of affairs. On the medical side a good amount of attention has been paid to construction of new hospitals, introduction of Domiciliary T. B. Treatment, T. B. Hospital at Yousuffguda, establishment of Radium Institute and setting up of T. B. Clinics.

Nawab Mehdi Nawaz Jung, Minister, Health and Rural Reconstruction, in his inaugural speech, appreciated the achievements of I.M.A. and advised them to continue to be the real members of this noble profession, and strive hard to create a welfare state. Doctors should see that its reputation was not marred.

Dr. G. S. Melkote, Minister for P.W.D. and Labour, inaugurated the Scientific Session and addressed members of the Association to approach the various Medical and Public Health Problems in a scientific manner.

Dr. M. Chenna Reddy, Minister for Planning and Agriculture inaugurated the Scientific and Industrial Exhibition. He drew attention of the profession to the prospective cost of modern drugs and advised the necessity of manufacturing the drugs, equipment and apparatus etc. in our country.

Dr. Mrs. Shantabai Satwalekar, the President of the Conference, expressed her gratitude for having elected her as the President and spoke as follows:

The Student: The student who is to be made a doctor has to be highly cultured, broadly educated, intelligent, humane, sympathetic, of high integrity, but above all he must not only love his profession but love his fellow men, and be able to share their joys and sorrows. Selection will have to be made on individual merit.

The material to be taught is intricate and complicated, and yet it has to be precise as our knowledge of biochemistry, enzyme chemistry and tissue microscopic changes is daily becoming more and more definite and accurate and the field is broadening. Hence a medical graduate has to know more about this today, than what it used to be thirty years ago.

Immediately after graduation the young doctor has to prepare to face the world and its occupants. If he has to fit himself into the pattern, it is very essential to impress upon him that he is going out into this world and has to face the suffering humanity. The suffering is physical and mental made worse by ignorance and socio-economic stress. A young doctor will make a success of his life if he believes that he possesses a magic wand of cure. This art of healing which has its foundation on sciences and observation is to be put into practice gently, unfailingly, kindly and very patiently. He should always remember that it is an art to practice medicine. This is to be developed and cultivated individually almost to the level of an artist. This alone will help him to understand the clients he has to deal with.

DR. MRS. SHANTABAI SATWALEKAR, PRESIDENT OF THE CONFERENCE.

If our young graduates know this fact they can be engaged in hospitals for the sake of experience for a short term and given special training. Equipped thus they can go anywhere and will be fit for service in life.

Teacher and Tutor: These are chosen according to certain standards laid down by the University. The zeal of the teacher to teach, the ability and skill in any particular subject, and the way the knowledge is imparted to the students should always be taken into account. Imparting of knowledge is an art by itself and it can be developed only by a special training. The teachers require to keep up-to-date with the ever increasing new discoveries. The teaching has to be very painstaking when it comes to bed side. Since individual

attention is essential at this particular stage, the tutor should not be over-loaded with extra students, but he should have a small group of not more than ten, almost a small family, who move together and learn first hand.

The time has come to take a practical view of things in teaching. It is very true that every student must know every subject that is taught. This procedure is correct from the point of view of the knowledge and the tests the student has to give. But operations cannot be taught by mere seeing them. How much can a student see in an operation theatre specially when finer operations are being performed? Yet a student has to know the technique of surgery and needs to crowd the operation theatre.

We are getting more correct and very accurate in our diagnosis and diagnostic methods, but the value of clinical observations and findings is of the greatest importance. It is advisable that we encourage the students to spend more time by the bed side, observing the signs and symptoms, noticing them first, and only later to run to the laboratory for confirmation of the diagnosis by microscopic and chemical evidence.

It is here by the bed side that the professor has to be at his best, as he has to lead the raw untrained students into the high state of training. It is here that the gentle touch is developed in such a way, that the sufferer feels that your touch is comforting but all the while you are searching for the seat of trouble. It is here one has to learn to say Yes-Yes-Yes almost never saying No. By your calm hearing you are to understand the patient thoroughly. The students ought to have an example set to them at this stage to win the confidence of the sick, to develop a kind and gentle manner.

With the Community Projects, we are getting trained personnel at the Village Level Worker to teach hygienic ways of living. Protected water supply is being introduced and the people are being educated about water borne diseases. Vaccination is not as yet compulsory but the public is awakening to it. Educating the ignorant public is a tremendous task, but our Government and the people are doing it with pleasure and a sense of duty. With the Second five year plan it is expected that no area in this State will be inapproachable. Medical Units will be established within small areas and with the Mobile Unit attached to them, all the sick people will get medical aid in time.

Nurses: It is a well known fact that a doctor cannot do any work without the nurses. Their service is not in any way of a lesser quality than that of the doctors. But there is such a shortage of nurses all over India. This is a very serious question and I definitely draw the attention of the educationists, social workers and others to this point and request them to encourage young women to take up this noble profession.

Drugs: I feel I must say something about the drugs that occupy so prominent a place in our daily life. All is not well and satisfactory. The allopaths are charged by the public as being very expensive, not only with the doctor's fees alone, but also because of the cost of drugs in use. We are very proud of the scientific composition of the chemotherapy and antibiotics we deal with. Many of these drugs are out of reach of the middle class. We are very rapidly losing the art of writing prescriptions and are coming to patent medicines. Full bottles of 10 or 20 pills are sold every time by the Chemists and purchased by the people. Many a time all the contents are not needed. I consider this a national waste of money. It is for us to put a check to this and insist that just as much medicine as is needed should be sold. The sale of whole bottles should be discouraged. Much money can be saved by this procedure in the middle class families and utilized later by the sick for purchase of tonics etc.

It is here, that the other systems of medicine in vogue in our country, score over us and that is a very important point for our consideration.

I am definitely of the opinion that Chemists' Shops should not be opened almost at random. A licence for the sale of drugs should not be granted to those who can raise a capital but it should be granted only to those who have studied Pharmacy. A regular checking and inspection of these shops is needed. The State needs to have a very firm control over the sale of drugs and I request that the Drug Control Act be implemented firmly to the letter.

This brings me to the topic of free service and dispensing of free medicines; but how can this ideal be achieved, unless the rich come out with munificent donations? In my opinion free service is not appre-

L.-R.; Dr. B. R. Davare, Dr. Mrs. S. Satwalekar, Dr. L. R. Deshpande, Dr. A. S. Puntambekar.

ciated by those who receive it, as they doubt it. Those that offer it do not do so unconditionally.

Security: Man has no reason to be afraid of anything under the Sun, provided he has positive health. He wants security from illness and desires positive health. Positive health is the fundamental right of any human being, and that is what a State owes to the people.

Efforts are being made all over the world to prevent onset of disease. Attempts are made to supply water which is not polluted. The villagers are taught hygienic way of living and with the aid of the radio and cinematograph much information is given about preventive medicine Similarly, maternity and child welfare facilities are being provided increasingly.

Every one of us, including the most uneducated have a philosophy of life depending upon what he is taught, what he experiences, reads, hears, sees with his own eyes and reflects. A man's philosophy usually takes into account himself, his origin, his purpose in life, his relation to society and his destiny. Naturally there will be diversity in his philosophy with his personal conduct as a member of society.

Let this human race trace its history as far back as you wish. You can always recognize the instinctive urge which man has demonstrated throughout ages to perfect himself and to make a better world in which to live.

Next, is man just an isolated individual or a member of a society? This is where a young graduate has to be taught that, he himself has a special mission and position in society, with clear cut obligations and responsibilities. Until our generation the social role of the physician was rather limited. He carried out his practice alone. Later the association of doctors was formed for exchange of scientific ideas and relaxation with one's own kind with friendly colleagues.

There was a time when practice of medicine was a simple thing. Now it is very much organized. Now our deliberation, our mode of exercising our profession are not our own concern, but are open to scrutiny, or I should say are open to criticism of legislators and press.

We doctors have a tendency to avoid any social and political controversial points. How many of us are actually in the know of things about legislative matters pertaining to our profession? It is doctors who should solve socio-medical problems and not legislators. When new schemes on medical education and hospital control etc. are being put up then advice should be sought from the brightest and most experienced doctors, even if such people do not hold Government posts.

There are certain difficulties felt by a private practitioner in his daily walk of life and this is a suitable opportunity to express my feelings about the same. That the certificates issued by a registered practitioner should be countersigned by a civil surgeon, is a matter of great perplexity both to the patient as well as the private practitioner, in as much as, all registered practitioners are equal and equally qualified not only to treat but also to certify, regarding any illness. The patient, if he has the treatment at a private practitioner's place is placed to such inconveniences, having to wait upon a civil surgeon even covering long distances, and some times having to wait on for days together.

Secondly, the arrangement made by the government, for the reembursement of expenses incurred in illness by the government servants has led these people to go and take treatment, only at the hands of those government doctors who have been earmarked for the purpose, with the result that the private practitioner loses these patients from his clientele.

It would not be out of place to say a few words to the public and the ladies that go about visiting the sick. It is through these hard working ladies that we can approach the criticising lay public. There are a few articles in the papers lately about silent zones around the hospitals etc. The sick require rest and have left their own peaceful abodes for having that at the hospital.

The hospital visiting hours cannot be described in any other words than a mela for 2 hours every day. It looks as if we are very kindly inclined in making such visits to our sick friends and relations; but in fact we are doing greater harm and little good. We may even make matters worse by carrying infection. The numbers who visit each case should be restricted. We have come to restrict the time of visiting the sick. Gradually we should educate the relations and the sick and make them understand the necessity of restricted numbers of visitors, and thus help the sick to recover rapidly and also help the hospital authorities to maintain order. This is a very painstaking and patient work but sooner or later it will have to be done.

There are about 20 Maternity Homes in the twin cities of Hyderabad and Secunderabad. Most of them have trained staff and a fairly good standard of service is maintained. For amount of gynaecological and obstetrical surgical work is done in some of them.

With a population of over 13 lakhs there are hardly any fine nursing homes to mention. Hardly any general survey is done outside the general hospitals. I am mentioning this for the benefit of the new graduates for whom a wide field is open for their activities.

The following resolutions were passed at the Conference:

1. This Conference expresses its deep sorrow on the sad demise of the following members and extends deep sympathies to their bereaved families: 1. Dr. Sham Rao, 2. Dr. Venkat Ram Rao, 3. Dr. R. J. Bhole, 4. Dr. Bilmoria.

2. Resolved that I.M.A. should collaborate with welfare agencies, physical culture organisation, medical education and social service departments of Government to evolve a scheme for as far as possible looking after the health of all the children of school-going age of 8 to 14 irrespective of whether they go to schools or not, as to build their physical, mental and moral health in such a manner as would be conducive to their ultimately becoming a national asset as citizens.

3. Resolved that the Government of Hyderabad should give facilities to private registered medical practitioners of modern medicine in receiving training in X-ray and associate them in domiciliary treatment of T.B. by starting short term courses, not exceeding a month or two, so that the State Government may get the necessary number of personnel in the implementation of its health schemes envisaged in the State's Second Five Year Plan.

4. Resolved that the I.M.A. should contact Government and authorities of private hospitals and nursing homes and draw up programme to see the people proceeding for special training/study abroad under I.M.A. internship arrangements, are suitable for such internship training, so that no wastage of training and talent is permitted.

5. It is resolved to request the Excise authorities to arrange the issue of excise permits without much delay and freely for the purchase of such narcotic drugs as morphia, pothidine and spirits etc., to registered qualified medical practitioners for their use in their daily practice.

6. This Conference resolves that all registered medical practitioners be considered equally entitled to treat all Central and Hyderabad State Government servants and charge them for services rendered on a scale that may be fixed by the Government—with a view to giving the desired doctor-patient relationship and confidence which is so essential in the matter of treatment.

7. This Conference requests the Central Government to start a School of Tropical Medicine in the South preferably in Hyderabad.

8. This Conference feels strongly and recommends the Government that a sanitarium be immediately opened in the State preferably at Shorapur in Gulbarga district or Kushtagi in Raichur district which are suitable for

the purpose, as both the places are nearly 2000 feet above sea level.

9. This Conference requests the Government of Hyderabad to permit the members of the Working Committee and Central Council of the Central Body of I.M.A. to proceed to meeting of this Central body which are held quarterly and this period of absence be treated as on duty without T.A. if the nominee happens to be a Government employee.

10. Medicine serves humanity irrespective of race, religion, creed or any particular social order. In the last few years, the Hyderabad State Branch of the I.M.A. built up good traditions and ideals second to no other State branch of the I.M.A. For this good work to be continued without any kind of interruption this conference is of opinion that the same homogeneous set up be continued, irrespective of any future organisation of the country on any basis.

VII ASSAM MEDICAL CONFERENCE, SILCHAR, 1956

The 7th Assam Medical Conference was held at Silchar on 25th, 26th and 27th February 1956, under the auspices of the Assam State Branch of I.M.A. The chairman of Reception Committee Dr. B. Bhattacharyee accorded a hearty welcome to the delegates and guests. In his speech he gave a short history of the place and stated comprehensively many valuable points regarding the medical profession. He expressed regret at the excuse cited by the Government regarding dearth of medical personnel. He rightly emphasised that the inattractive emoluments offered by the government prevented the doctors from joining in the government services and not the shortage of personnel. He said that a mere eyewash was being given in the Rural Health Service which required upgrading. Preventive medicine should be given more priority. Paucity of funds or dearth of personnel should not be a plea for failure of schemes.

The conference was inaugurated by Shri K. D. N. Singh who in his inaugural speech requested the doctors to develop missionery spirits within them. Then the president Dr. K. C. Barooah delivered his presidential address. He frankly expressed his mind in criticising the Government about the shortfalls whatsoever.

The exhibition was opened by Shri S. K. Deb, the chairman of the Municipality. The General Secretary Dr. S. P. Nath read out the messages of good will from Raj Kumari Amrit Kaur, the Central Health Minister, Dr. A. C. Ukil, the president I.M.A., Shri B. R. Mehdi, Chief Minister and others.

The scientific section was inaugurated by Prof. M. L. Chakravarty, Prof. of Physiology, Calcutta Medical College.

Dr. K. C. Barooah the president of the Conference spoke as follows :

To-day most of the human sickness is concentrated around the middle of the earth, the tropics, constituting the so-called tropical diseases. India with its vast population is in that area and offers big problems of medicine and public health services. Climate, flood, famine, illiteracy, hoary traditions, superstitious beliefs and last but not the least, the incredibly low economic condition of the people play their part to make them still more difficult. Besides these, 88 per cent of its teeming millions live in villages. Obviously the problem of India is the problem of rural India with all those factors offering real inhibitions against a proper solution. If the purpose of our existence is to serve the country, we should not be oblivious of the condition of health and medical services in rural areas and must show a serious concern about it. Without a conception of environment and prevailing condition in it and without a sense of purpose, men and societies cannot thrive morally, economically and culturally. The medical men have a grave responsibility to fulfil. They cannot afford to be silent spectators of this pitiful scene and must learn to translate the empty words about rural medical relief and rural reconstruction in terms of complete contemporary reality. They must alert the Government and transform the dumb millions from mere spectators of this enterprise of eradication of diseases to a group of intelligent participants.

The principle expressed in the constitution of the World Health Organisation that the Government have a responsibility for the health of the people and that responsibility can be fulfilled only by the provision of adequate health and social service needs no re-iteration. It is the State's concern to pool men and money for that purpose. But here lies the snag. The extravagance shown in other branches of its services stands conspicuously ugly in contrast to the miserliness meted out to the medical and public health services. The Government of Assam is not the solitary sinner in this respect, the Union Government is no less so. Eminent persons like Rajkumari Amrit Kaur, the Union Health Minister, complained of this in open conferences. I need not repeat those sad words which I have done on several occasions.

While our cultural missions sent out to different countries at heavy cost, have been demonstrating our beautiful dances and music, our men, women and children here are dying in thousands for want of proper medical aid due to lack of funds. The craze for exhibition of our cultural and other heritages to the foreign countries has so much preoccupied the minds of our politicians and a morbid craving for approbation has so much infected their brains that one cannot re-construct the state of mind which would render a correct attitude towards rural medical aid possible. The lack of all sense of priority and proportion and even of self-preservation, which this callous attitude towards the health and hygiene of the people reveals in our patriots charged with the destiny of our country and all those who depend upon them is appalling. It might smack of a little hyperbole to many, but I declare a well-attended bed in a clean hospital in a rural area would speak more of India's progress than all the performances of our dancers and cultural delegations, to a discerning eye.

The first necessary condition of the recovery and growth of national prosperity must be an honest plan for rural medical aid. Without it a plan is barren and the progress of a country is unintelligible. Idol worshipping India spends more money and emotion on stone gods and human political gods than on suffering human fellow beings. It is frittering away its energies on imbecile vanities; that is the whole tragedy. The slow pace of change in the rural medical aid of the pre-independence days is but little accelerated even after eight years of our independence. Whatever little that has been done is not to proportions of national significance. Being a town-made system, our medical relief has failed to meet the rural needs, of which our men in charge of medical and public health services were unable to recognise the distinctive characters. It has left a vast population at the mercy of the quacks, vaids and charlatans—to the cruel fate of dying without a drop of medicine.

Coming to Assam, I might say without fear of contradiction that rural medical aid is grossly neglected. The function of public health and patient-care which it has to fulfil is done very indifferently as regards the majority of population. Since the Ministry of Health has probably taken it a vow not to publish the public health report even this year, it is not possible to talk in terms of statistics about it. But I can tell you, it has not improved since we met last year at Shillong. The danger of epidemics to which our rural population is exposed is not a whit lessened by the present public health activities of the Government. As the recent epidemics of cholera and food poisoning will show, there

is a leap in the death rate with which neither our plan for the extension of medical aid nor our latest advance in medicine could keep pace.

The First Five Year Plan which offered the Government of Assam to make a good beginning of the reconstruction of rural medical relief of this woeful province ravaged by flood, earthquake, squalor and poverty and cursed by a cruel hand has run out without any achievement worth the name. Whatever achievement the Government claim, has little connection with our ideas of rural medical aid and is concerned only with urban development. That the planners with their vaunted rural outlook and anxiety for rural medical needs of our State should have missed the opportunity to do something for them, leaves one speechless with amazement.

No one can measure in restrospect the effect of this failure of the First Five-Year Plan upon the much needed rural medical relief of Assam. Many might argue, that it is no use crying over spilt milk. It is quite true, but a retrospective criticism of the Plan and the working of it will be an education itself and illuminate many of the dark patches we could not see before. In the absence of an effective public criticism the administrative heads are indulging in unrestricted liberty and remissness unthinkable in any advanced country. Bogged by a morass of an official red-tape the public health measures find themselves difficult to move. Unless we rescue medical plans from the enervating clutches of a red-tape, the future of medical service in our country is dark. Its slow snail's pace is fundamentally opposed to a dynamic programme which we must chalk out and execute on a military level if we are sincere about turning the platitudes about rural reconstruction into a living reality. From departmental recommendation to the cabinet decision through a labyrinth of slow clumsy system of checks and counterchecks, files and notes cannot surely be a proper method of dealing with a situation when ignorance, bad living conditions, malnutrition are sapping the manhood of a nation and preventable diseases are killing our men in thousands. It is a cruel unnecessary luxury, we can ill afford to indulge in. I wish some antidote to this slumbering effect of a red-tape is found out to whip oft this lethargy into a true gallop which is not only a necessity but a demand.

The two patent excuses advanced by the Government, viz., the paucity of funds and lack of personnel do not stand scrutiny. It is a sheer mockery to complain of limited resources when one fails to spend the available funds inspite of pressing needs. It is pure undiluted travesty of facts. About the other excuse of shortness of personnel, I may tell our credulous countrymen not to be hasty in assigning it as the cause of the difficulty of the Government, as our planners and the Ministers take pains to convince them. While admitting a shortage of men for specialised posts like that of teachers and specialists, I am constrained to say that it does not hold good in case of basic doctors for the rural areas. I have exposed that myth in my address last year at Shillong with facts and figures. This should cease to be cited as an excuse for the failure of the Government to uplift the rural health services. Causes must be searched somewhere else for their lapses. There was a time when our Union Minister of Health used to advance the same facile excuse of shortness of personnel, while explaining their lapses in the rural health programme. But since our last president Dr. S. C. Sen has exploded that excuse, she no longer harps on that theme and a sense of realism has come to her speeches as indicated in her latest one at Delhi, when she emphasised on the necessity of providing facilities and amenities to medical men, so that they might be attracted to the rural areas. Let our Ministers take a leaf out of her wisdom and stop singing that unintelligible chorus.

The failure of providing proper medical service to the rural areas rests not so much on the inadequacy of trained personnel as on the Government's failure of creating a condition favourable to a free flow of doctors to those areas from the towns, where they are at present unduly congested. I maintain, the Government have not made as yet any serious attempt in this direction. On the other hand they are taking certain retrograde steps that threaten the future of rural medical service of Assam. The creation of a new cadre of service known as Assistant Surgeon I Junior and the so-called 'conversion plan'.

A mere pittance of Rs. 175/- a month cannot certainly inspire a young graduate after a lengthy, expensive and arduous course of studies to assume the responsible post of a doctor and settle in our villages where conditions of living are extremely depressing. The political leaders' constant harangues and precepts on sacrifice and austerity on the part of the medical men, have produced a sort of psychological revolt among our coming generation. I will advise the leaders to

DR. K. C. BAROOAH, THE PRESIDENT OF THE CONFERENCE.

make a thorough search of their hearts and I am sure they will find there something for self-condemnation and restrain themselves from indulging in such talks on sacrifice. It is pity that while they themselves practise in available luxuries, they should evince the greatest wish to guillotine them in others.

In a society gradually but surely adopting a higher standard of living, the craving of our youngmen for services other than medical will be an inevitable reaction to this myopic policy of the Government. Medicine will be left to the mediocres. The national price for this petty economic gain will be a decline in the standard of medical men and a rise in the demand for experts and specialists from outside the province. You may accuse me of pessimism, but I tell you, this is the mental antecedent of the externally quiet but internally disturbed medical profession of today, which is heading towards a real crisis.

Besides this the so-called 'conversion plan' of the Government of Assam is creating another problem in the existing medical and public health services in the

rural areas. According to this plan certain posts which were so long been held by the licentiates have now been set apart for the newly passed graduates under an unintelligible new cadre of service called the Assistant Surgeon I Junior. These posts are generally situated in small towns and comparatively better places of the rural areas, which will under this plan, be out of bounds for the licentiates in service. This move has created a lot of resentment among the licentiate doctors who have so long been giving excellent service to the entire satisfaction of the people in those areas. They are now entertaining a fear of being pushed slowly and deliberately to the innermost villages to which our medical graduates might not be persuaded to go.

I consider this to be a wrong and tactless move and have expressed my disfavour on several occasions and requested the Government to retrace its steps before they are landed into further trouble. It is no justice to the licentiate doctors, who have to their credit a faithful service of 15 to 20 years, to be driven at the fag end of their career to innermost villages where there are no facilities for the education of their grown-up children. Government servants working in other departments are gradually promoted to higher positions according to their length of service and experience, but in the case of Assistant Surgeon II, this practice is never followed. Not to speak of recognition and rewards, these faithful friends are now punished with the deprivation of their prize posts so long creditably held by them. Naturally there is brewing a lot of discontentment in the services and when these licentiates find themselves pushed to such a position of humility and inequity, they are sure to withdraw their co-operation or even if they co-operate at all out of their sheer economic condition, they will do so without any heart and with certain amount of mental reservation. As a result of that our rural population shall be the worst sufferer.

If the Government agree with the resolution of the I.M.A. passed last year at Shillong, recommending them to treat the licentiates of ten years' experience at par with the newly passed graduates this distinction is unjustified. This imbecile plan has also the further drawback of creating another class distinction and discontentment amongst our graduates endangering the very aim for which we all have identical anxieties. The reasons are obvious and require no elaboration.

In the context of the above, our rural medical problems have become tangled and complicated. They challenge our imagination and constructive ability. They challenge our science. Unfortunately our response to it is extremely feeble. India is too poor and too preoccupied with other things to pay for a good medical service. But it is the strength and the sacrifice of the medical profession that will bring succour to the millions of our suffering brethren in the rural areas. To make life more beautiful, we must allow ourselves to be sacrificed. We must be martyrs for a better world and our martyrdom will not go in vain.

Second Five-year Plan.

The planless first Five-Year Plan has come to an end. We are now in the threshold of another five-year plan. Only tomorrow's hope and optimism sustain us today. If something breaks it nothing will be left.

You might remember, the I.M.A. Assam State branch submitted its suggestions and recommendations to the Government of Assam for their consideration and inclusion in their 2nd Five-Year Plan for the medical and public health development of the State. Although the Government of Assam did not even acknowledge the receipt of those suggestions, we have at least the satisfaction to see that they have been adopted almost to their entirety and if my information be correct they were well appreciated by the Planning Commission at Delhi. This fact affords clear proof of what co-operative activity between the Government and a technical association can achieve in matters of planning about which most of us have limited ideas. It is difficult to exaggerate the importance and effect of this co-operation in the field of implementation of plans too. The Government should not fight shy or think beneath their dignity to consult and seek the co-operation of organisation like the Indian Medical Association, whose anxiety and interest in the medical problems of Assam and whose knowledge about them is not a whit less than theirs. I am sorry to mention in this connection that it was we who showed our intense anxiety for the Second Five-Year Plan and it was at our behest that the Government came down from its high pedestal to discuss matters with us in June 1 last year. Everybody thinks it ought to have been the other way. These discussions as were expected and afterwards recognised benefitted the Government to a large extent. It might not be out of point to state that the Government did not even think it proper to make an official approach to the I.M.A. for its suggestions. As far as I know, the I.M.A. had no official letter addressed to it, neither have we received any copy of the draft plan as yet. This non-recognition of the I.M.A. by the Government is a serious lapse of duty on their part and we strongly resent it.

The draft Second Five-Year Plan of the Government of Assam in spite of its limitations had much to be commended and naturally we entertained a hope that the implementation of the scheme would go a long way to improve the existing deplorable urban and rural health services of Assam. But with the unfortunate drastic prunning down of the entire plan of the Government of Assam to one fifth of its original one, even that hope is receding to a distant horizon. This slashing of the modest scheme for the medical and public health development of Assam should evoke sharper criticism from the press and platform and should be resisted by a united voice of protest. Departments like this should not be hampered, but should receive due priority of consideration specially in an undeveloped State like Assam. The health plan of our State will now be plodding when actually we expected it to soar.

I am sorry to say that the employment of potential and requirement part of the Second Five-Year Plan of the Government of Assam is depressing. It is disquieting to see that for the implementation of the plan, Assam will have to recruit trained personnel from outside the province in every category of service beginning from specialists and professors down to nurses and health visitors. Since the trained personnel in other States are sure to be absorbed in their own developmental plans, it will be foolish to expect them for Assam. Indeed the residue that might trickle down to Assam, will come at a higher cost of money or probably the refuses of those States, reducing our State to the deplorable position of a dumping ground of mediocres.

In spite of all that has been said regarding some drawbacks of the plan, it has many good points. Indian Medical Association Assam State branch must extend its support to the Government to implement it and be prepared to take its full share of burden of this work if requested to do so. It might demand some amount of sacrifice from its members and might exact unremitting efforts, but since the cause is good they must be ready for them.

Ayurveda.

The Government should follow a well-planned definite policy and not a mere expedient dictated by sentiment and other considerations not related to a scientific outlook or by the personal likes and dislikes of the laity. They should not oscillate between conservatism and reform, but should adopt a bold aggressive modernness in their attitude towards Ayurveda and modern scientific medicine. But that attitude uptill now is amazingly vague. Medicine to-day has moved far out of the dark ages of socialism and traditional superstition into the light of science. India's progress lies that way.

Science to-day is harassed by a multitude of prejudices—personal, educational, economic, political and national and last but not the least the ready omniscience of the uninformed political leaders of our country. The attitude towards Ayurveda is but a typical example. Medicine to-day has moved far out of the dark ages of socialism and tradional superstition into the light of science. India's progress lies that way.

Post-graduate Training and Medical Research.

A lot of money is drained out of India in the unrestrained pursuit of post-graduate medical education in foreign countries. This can easily be saved by opening out two or three centres in India. Calcutta, Madras and Bombay offer ideal conditions for post-graduate teaching. Post-graduate work in particular specialities should be started in medical colleges where facilities for work exist. Talents which cannot find scope for higher studies in foreign countries due to poor financial resources will find opportunities to unfold themselves in these institutions enriching our profession in India.

In specialised branches of medicine, Assam affords practically a vacuum. It has the danger of being filled up by anything but a standard and recognised specialised service, which might prove detrimental to its medical education and its services.

As regards medical research, it is generally complained that the spirit of research on the part of majority of our colleagues in the teaching staff is woefully lacking. Even in diseases that are common in India, little originality and initiative in approach and outlook has been demonstrated. There is no dearth of talents and intelligence in our midst, but what is missing is determination and tenacity of purpose, which is commonly ascribed to our faulty education and training. Modern research is an extensive affair and involves not only talents but lot of expenditure, without which good results cannot be achieved. Besides this, it has ceased to be an individual affair and has assumed the character of a team work of a group of hard-working ardent believers under the leadership of a genius. Drug and medical researches are no exceptions.

Assam is endowed with a wealth of valuable medicinal plants and a research in it has great possibilities. The Government of Assam should make an earnest attempt to open out a medical research fund. The tea and oil industry of our State should come forward to help the Government. The drug research that is being carried on in the Assam Ayurved College is done in a most perfunctory manner. The total estimated cost is 65 lacs in the next five-year plan. This amount instead of being wasted in that college could be better utilised in erecting a research wing of Ayurvedic medicine in the Pharmaceutical Department of the Assam Medical College, for which the Government is making a provision of another 75 lacs in that plan.

Assam Medical College.

The establishment of the Assam Medical College no doubt constitutes a major advance of our State. The importance of this institution in view of the role it will have to play in the future development of Assam's medical relief cannot be exaggerated. It is now stepping into the ninth year of its glorious life and is proliferating like a youthful tissue. Every year of its life a direct or indirect benefit is handed down to the people of this State. I.M.A. must exhibit enlightened interest in it and should advance constructive criticism about it from time to time.

It is disquieting to see that out of 179 students who have graduated uptill now from this college, only 67 are employed in different medical services of the country; the remaining 112 are still unemployed. The implementation of the Second Five-Year Plan, we hope will be able to absorb all of them. But the policy of the Government as regards to their remuneration is anything but conducive to attract them to the rural areas where their services are urgently needed. The present deplorable service conditions and the lack of amenities unless improved might act as further deterrents.

The re-constituted governing body of this highly technical college still remains vulnerable to pertinent criticism as before and a crying demand for a complete overhaul in the line suggested by the I.M.A. Assam State branch still remains. Nothing can be more injurious to this innocent institution than to expose it to the vicious and suffocating atmosphere of politics which is sure to stunt and retard its growth.

The selection of students is still based on a method coloured by primitive ideas. A new orientation of policy compatible with a broader national and scientific outlook will be a refreshing and progressive change.

Licentiates and the Indian Medical Council.

Let me now come to the question of the licentiates—the sentinels of India's rural health for over a century. A giant among social workers, the friend philosopher and guide of the poor teeming millions of suffering India, who sweated and bled to build up an immortal monument of scientific medicine in this country, is now denied the ordinary justice due to him. That the Indian Medical Council Act of 1933, which denies the inclusion of the licentiates in the all-India medical register should stand unamended even after eight long years of attainment of independence, is a shame and slur on the genius of Indian political leaders. It has bitten deeply into the hearts of the licentiates.

Indian Medical Association should take up this subject with all the earnestness it has in its command. Unfortunately uptill now the limits of sympathy in the resolutions of the I.M.A. on this point are extremely narrow. It should demand a clear policy of the Government on this issue and tell them with brutal frankness that the present laisez-fare attitude might drive it to the position of making the delicate and hazardous transition from co-operation to non-co-operation. There is little doubt that it is the biggest single factor contributing to the extremely low membership of the I.M.A. about which our presidents in different sessions of the All India Medical Conference have been complaining and for which there exist two different organisations of medical men today.

Pharmacy.

The Indian Medical Association cannot with impunity ignore the development of Pharmacy, which is sure to produce repercussions on the medical profession of our country. We should take an active interest in it. The Union Government is to be congratulated for its valued and sincere attempt to organise the pharmaceutical profession on a sound footing. It is really deplorable that we miss the same enthusiasm in the attitude of the Government of Assam towards Pharmacy. They have not fully implemented the Pharmacy Act even after seven years of its enactment and owe an explanation to the public for this inordinate delay.

Rural Water Supply and Sanitation.

Until the water supply and sanitary condition are improved our rural health shall always remain as a precarious interlude between catastrophic epidemics. The possibility of high standard of health fundamentally depends upon the adequate supply of clean water and hygienic living. Although majority of diseases are waterborne this side of public health measure has been awfully neglected. We are happy to note that the Government of Assam have realised this and have a scheme for this with a provision of a few crores in their 2nd Five-Year Plan.

Ourselves.

To be a good doctor one must be a good man first. Not only he should be trustworthy he should be efficient too, since he is responsible for people's lives. To justify the nobility of his profession he must be a person who can be trusted to use his judgment in the interest of

his patient and also a person whose judgment is really worthy. It is a calling which is not only a craft but a sacrament and a mission deserving all our surrender and devotion—obviously impossible to be measured in terms of money. We must look to the attributes of perfection and selflessness which is not taught in our educational institutes—something quieter and more human, a professional attitude which is more sincere and less spectacular, which has the intimacy of the quieter village roads and healing peace of the shrines.

The medical men must be rooted to the soil they want to serve. Our society is still unaccustomed to the type of medical practice seen in big cities and hospitals. It will take years to do that and in the meantime it will be to the mutual interest of the people and ourselves to adopt a system of medical practice which our society understands and appreciates. A doctor might be rising in social and economic status, but he should see that he does not lose the human touch with the indigenous population he is destined to serve. He should never aim at an aristocratic and individualistic attitude of mind. Scholarship, culture, freedom are but poor attributes if they fail to bring us closer to the downtrodden millions of our countrymen. With the great philosopher Nietze I cry "Friends, what will be thy happiness. Were it not for those for whom thou workest."

The following resolutions were passed at the Conference :

1. This conference records its deep sense of sorrow at the sudden and premature demise of the following members of the medical profession and the prominent leaders of our country and conveys its heartfelt condolence to the members of the bereaved families : 1. Dr. J. N. Roy, Gauhati. 2. Dr. Upendra Nath Dutta, Shillong. 3. Dr. Mohini Roy, Dhuli Tea Estate. 4. Rohini Kumar Choudhury, Gauhati. 5. Meghnad Saha, Calcutta. 6. Acharyya Narendra Deo, Lucknow. 7. Bijon Kumar Mukherjee, Late Chief Justice of Supreme Court.

2. This conference strongly resents at the indifferent attitude of the Government for not even acknowledging the receipt of the following resolutions adopted at the 6th session of the Assam Medical Conference held at Shillong in 1955, not to speak of taking any action on them. (Resolutions No. 3, 7, 8, 9 and 10 of the Conference held at Shillong).

3. This conference considers it with grave concern about the fate of the Medical employees of the Local Board and Municipal Board of this State after the provincialisation of the dispensaries and requests the Government to consider their length of service at the time of provincialisation.

4. This conference requests the Government to make provisions for refresher course in the Assam Medical College, Dibrugarh to private doctors as well as Government doctors to give training in the modern improvement of science.

5. Resolved that the Assam State Government be urged upon to bring forth amendment to the Assam Medical Council Act to effect the following change :—

(*a*) The president of the Assam Medical Council will always be an elected one.

(*b*) Total number of nominated members should never exceed 25 per cent of the total number of members in the Council.

(*c*) The existing different schedules be removed and a system of joint electorate should be introduced for the formation of the Council.

6. This conference reiterates the demand made by the All India Medical Conference to amend the Indian Medical Council Act 1933 in such a way as to include all the Medical practitioners statutorily recognised by the different State Medical Councils within its purview under one schedule and in a common register arranged alphabetically.

7. This conference expresses its surprise that the State Government insists on the counter-signature of medical certificates by the Civil Surgeon or any other Government medical officer when such certificates are issued by the registered medical practitioners to the Government employees and urges that this procedure should be stopped herewith.

8. This conference requests the Educational authorities of the State to introduce compulsory first aid training to the school students.

JOURNAL OF THE INDIAN MEDICAL ASSOCIATION

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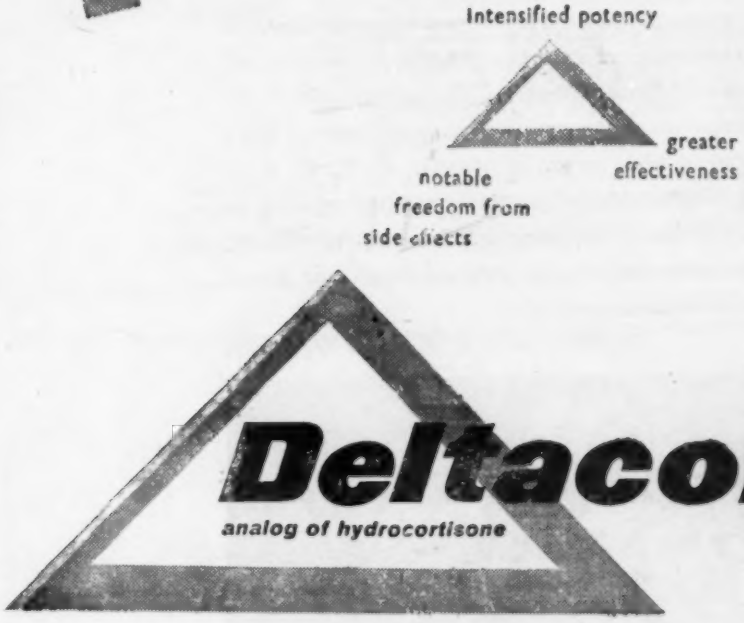

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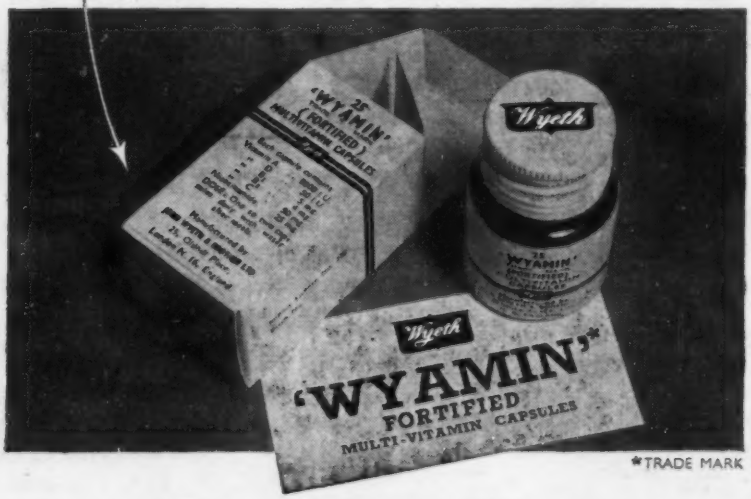

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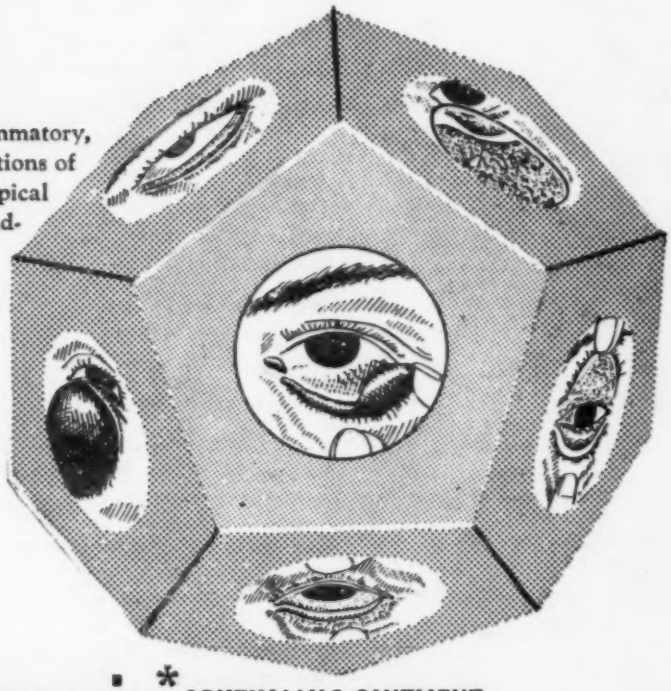

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